PHOTOFACT* Folder

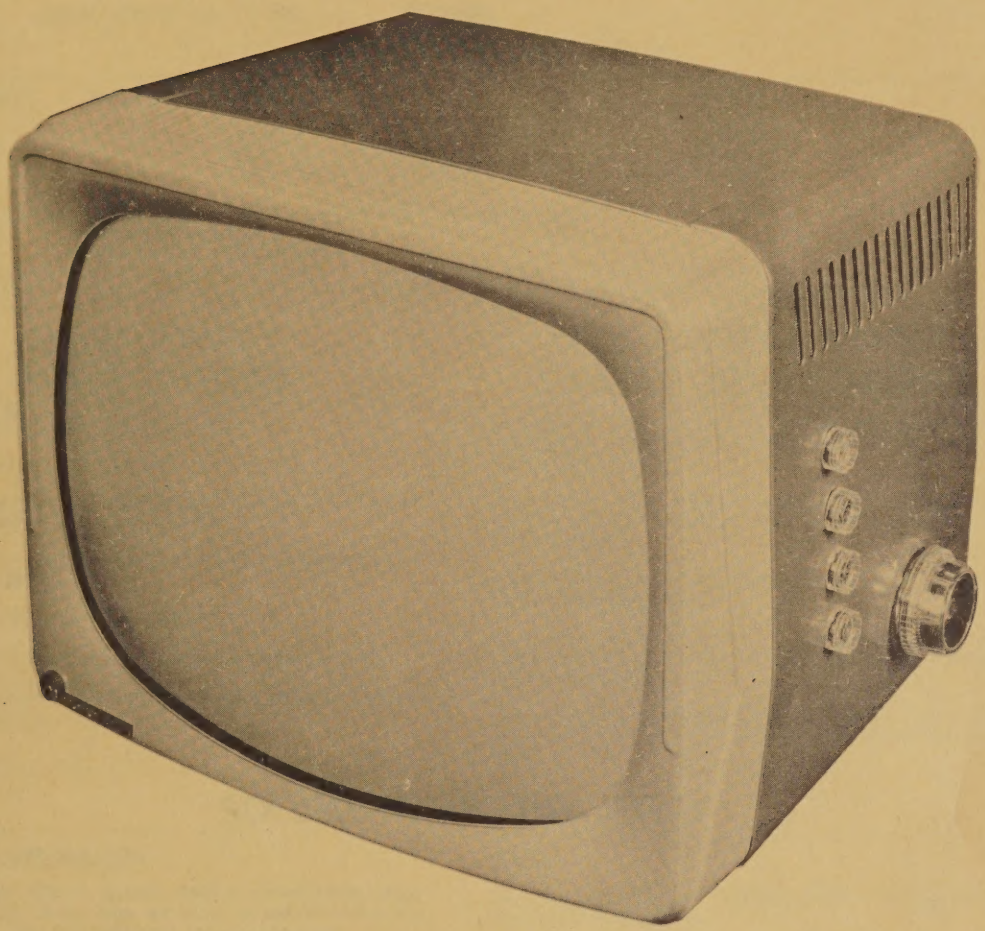


## IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MOTOROLA MODELS Y17P5-1, -2,
Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B,
M (Ch. LTS-430, TS-430, TS-430Y)



MODEL 17T32BZ (CH. TS-430)

MOTOROLA MODELS Y17P5-1, -2,
Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B,
M (Ch. LTS-430, TS-430, TS-430Y)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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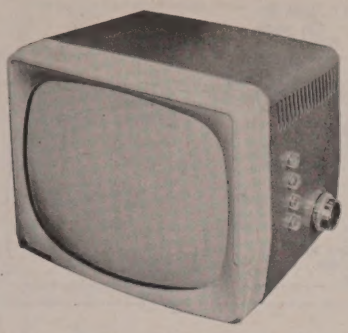
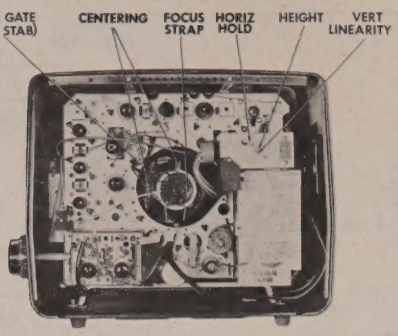
SET 445 FOLDER 1

PHOTOFACT* Folder

# MOTOROLA MODELS Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B, M (Ch. LTS-430, TS-430, TS-430Y)






MODEL 17T32BZ (CH. TS-430)

**CAUTION**

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

| | | | |
|---|---|---|---|
| TRADE NAME | Motorola | MODELS | CHASSIS |
| | | 17T33B, 17T33M | LTS-430 |
| | | 17P5-1, 17P5-2, 17T32BZ | TS-430 |
| | | Y17P5-1, Y17P5-2, Y17T32BZ | TS-430Y |
| MANUFACTURER | Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois | | |
| TYPE SET | Television Receiver | | |
| TUBES | VHF-Sixteen, UHF-Seventeen | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycle | RATING 165 Watts, 1.55 Amp. @ 117 Volts AC | |
| TUNING RANGE | Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) | | |

## DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 17T32BZ

1. Remove 6 push-on type knobs from the side.
2. Remove 3 metal screws holding rear cover and tuner antenna leads. Remove rear cover.
3. Remove picture tube socket, yoke plug, yoke clamp, yoke and speaker leads.
4. Remove 2 bottom chassis bolts.
5. Remove 2 metal screws holding top chassis braces
6. Partially remove chassis and remove HV lead. Remove chassis.

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from TP-7 to chassis. Connect a .1mfd 400 volt capacitor from TP-5 to chassis.

Adjust the Horizontal Hold to the point where the picture is almost stable horizontally.

Remove the capacitor from TP-5 and adjust the Horizontal Frequency slug (B1) to the point where the picture is almost stable horizontally.

Remove the clip lead from TP-7 and chassis. Adjust the Horizontal Hold until the picture is synchronized horizontally.

## SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Models 17P5, 17T32: Remove 2 metal screws from bottom holding front. Swing front out at bottom and lift to remove. CAUTION: Use only mild soap and water to clean. Model 17T33: Remove screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

SYNC STABILITY

Sync stability may be varied by means of a Noise Gate Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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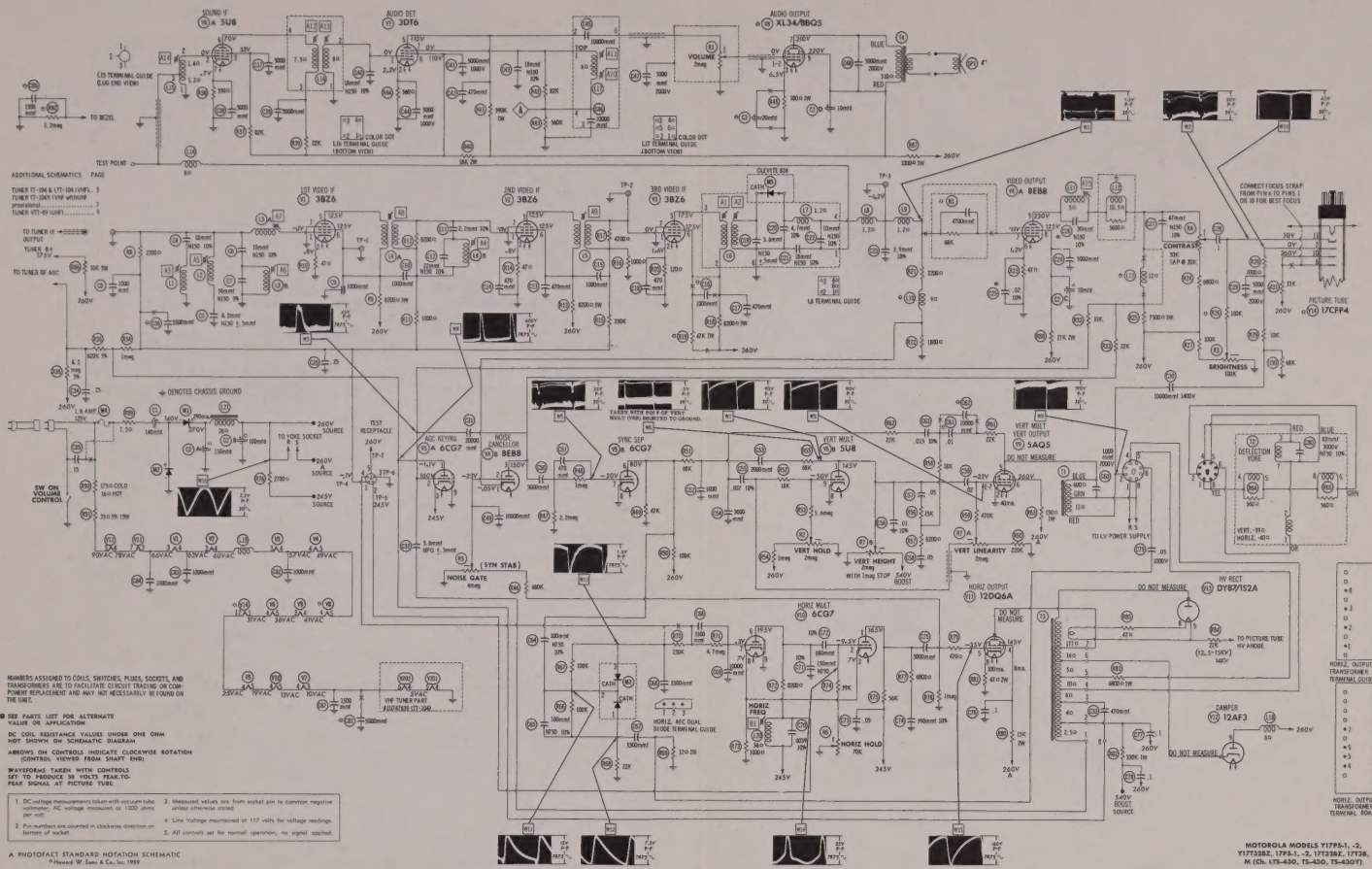
J199

DATE 6-59 SET 445 FOLDER 1

MOTOROLA MODELS Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B, M (Ch. LTS-430, TS-430, TS-430Y)

MOTOROLA MODELS Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B, M (Ch. LTS-430, TS-430, TS-430Y)

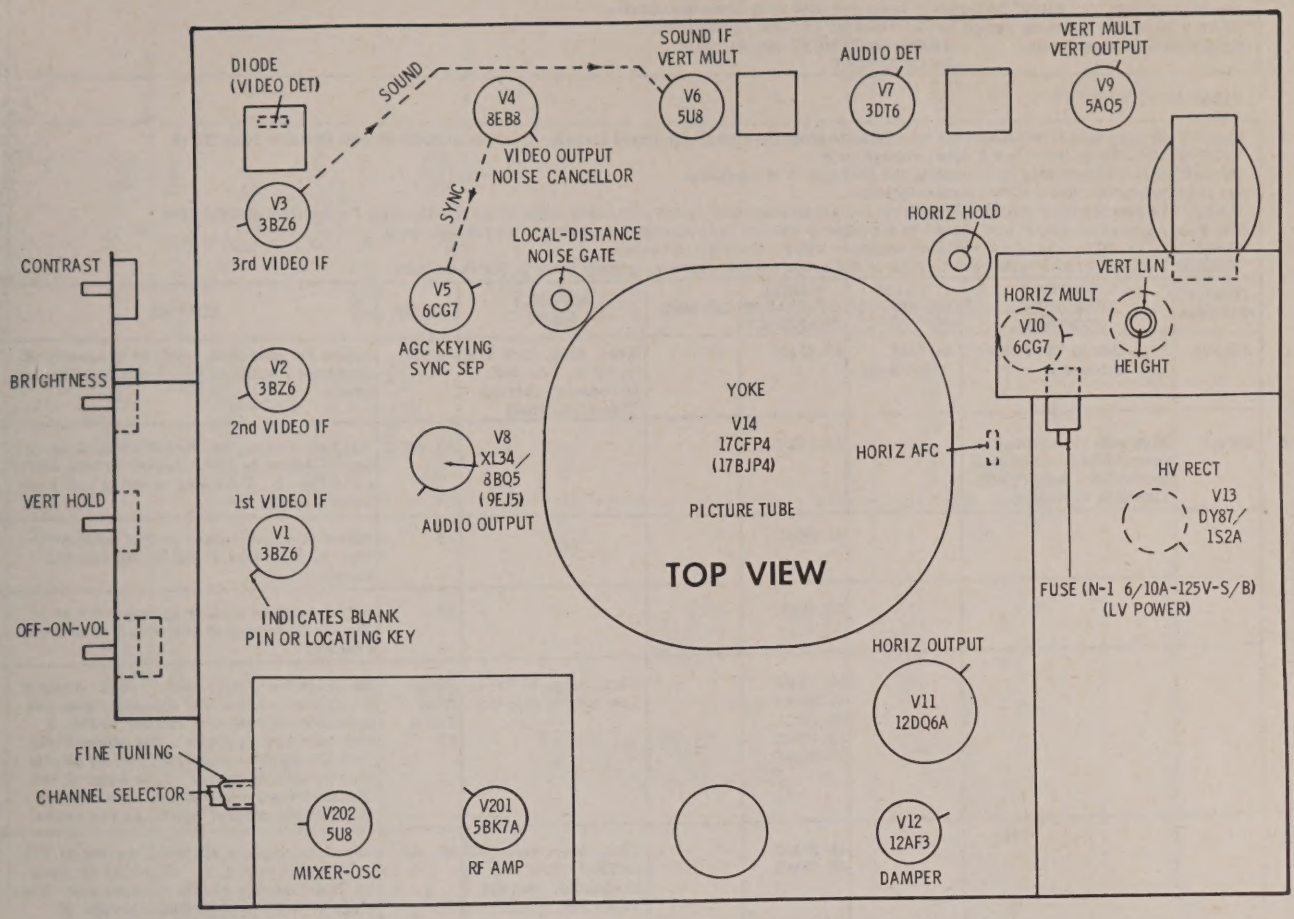
SET 445 FOLDER 1


SOUND IF
A 5U8
AUDIO DET
3DT6
AUDIO OUTPUT
XL34/8BQ5
VOLUME
1ST VIDEO IF
3BZ6
2ND VIDEO IF
3BZ6
3RD VIDEO IF
3BZ6
CLEVITE 824
VIDEO OUTPUT
A 8EB8
CONTRAST
BRIGHTNESS
PICTURE TUBE
17CFP4
CONNECT FOCUS STRAP FROM PIN 6 TO PINS 1 OR 10 FOR BEST FOCUS
TO TUNER IF OUTPUT
TO TUNER RF AGC
TUNER B+ 175V
ADDITIONAL SCHEMATICS PAGE
TUNER TT-104 & LTT-104 (VHF).. 5
TUNER TT-104Y (VHF WITH/IF preamplifier)..... 7
TUNER VTT-89 (UHF)..... 9
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
TO YOKE SOCKET
260V SOURCE
245V SOURCE
TEST RECEPTACLE
AGC KEYING
A 6CG7
NOISE CANCELLOR
B 8EB8
SYNC SEP
A 6CG7
VERT MULT
A 5U8
VERT MULT VERT OUTPUT
Y 5AQ5
DO NOT MEASURE
VERT HOLD
VERT HEIGHT
VERT LINEARITY
TO LV POWER SUPPLY
DEFLECTION YOKE
VERT. -310
HORIZ. -420
NOISE GATE
(SYN STAB)
HORIZ MULT
6CG7
HORIZ OUTPUT
12DQ6A
HV RECT
DY87/152A
TO PICTURE TUBE HV ANODE
(12,0-15KV)
HORIZ. OUTPUT TRANSFORMER TERMINAL GUIDE #2
DAMPER
12AF3
HORIZ FREQ
HORIZ HOLD
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD #5
VHF TUNER PART #LTT-104 ONLY
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959
MOTOROLA MODELS Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T38, M (Ch. LTS-430, TS-430, TS-430Y)

MOTOROLA MODELS Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B, M (Ch. LTS-430, TS-430, TS-430Y)

FOLDER 1

# TUBE PLACEMENT CHART




MOTOROLA MODELS Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B, M (Ch. LTS-430, TS-430, TS-430Y)

# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

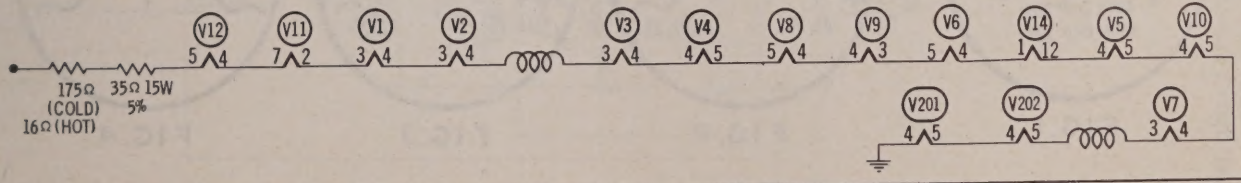
POWER SUPPLY FAILURE
No raster, no sound Fuse (1 6/10A), Rect. (B+)

SWEEP FAILURE
No raster, has sound Rect. (Horiz. AFC), V10, V11, V12, V13, V14, Rect. (B+)
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, Rect. (B+)
Vert. off freq. V8, V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det)
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V4, V5
No horiz. sync V4, V5, Rect. (Horiz. AFC)
No vert. or horiz. sync V4, V5

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)




FOLDER 1

# ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #9050L, 9150
WALSCO #2521

VIDEO IF ALIGNMENT

Remove the yoke plug to eliminate RF interference from the horizontal sweep circuit. Connect a 1500Ω 50 watt resistor from TP-8 to TP-6. (CAUTION: TP-8 has B plus voltage on it.)
Disable the tuner oscillator by grounding the grid (pin 9) of oscillator.
Set the Noise Gate control fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 6 volt bias supply to TP-4. Positive to chassis.
Maintain between 2 and 5 volts peak to peak on the scope except where otherwise noted in the procedure.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .001mfd | High side to TP-2. Low side to chassis. | 44.0MC (10MC Swp) | 45.75MC | 13 | Vert. Amp. thru 47K to TP-3. Low side to chassis. (Across Video Det. load) | A1, A2 | Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. |
| 2. | Direct | High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis. | " | 47.25MC | " | " | A3, A4 | Increase scope gain. Remove bias if necessary. Adjust to place marker in trap notch. as in Fig. 2. Tune slug at end of coil away from chassis. |
| 3. | " | " | " | 41.25MC | " | " | A5 | Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil nearest chassis. |
| 4. | " | " | " | 39.75MC | " | " | A6 | Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis. |
| 5. | " | " | " | 39.75MC<br>41.25MC<br>44.0MC<br>45.75MC<br>47.25MC | " | Vert. Amp. to TP-1. Low side to chassis. | Mixer Plate Coil & A7 | Set scope for 3 volts peak to peak. Restore 6 volt bias. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate Coil affects the center peak and A7 affects the two outside peaks. Tune slugs at end of coils away from chassis. If a suckout (trap effect) occurs, detune A8 to remove. |
| 6. | " | " | " | 42.25MC<br>45.75MC | " | Vert. Amp. thru 47K to TP-3. Low side to chassis. (Across Video Det. load) | A8, A9 | Adjust A8 to place 42.25MC marker at 50% on curve as in Fig. 4. Adjust A9 to place 45.75MC marker at 50% on other side. Tune slugs to end of coil nearest chassis. If necessary, retouch Mixer Plate Coil to correct tilt. Retouch A8 and A9 for correct response. |

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust all controls for normal picture and sound.
Connect the DC probe of a VTVM to point (A). Common to chassis. Adjust A10 for maximum deflection choosing the one of two peaks that produce the highest voltage. While listening to the sound, retouch A10 for maximum sound with MINIMUM distortion.
The top slug (A11) is a preset slug which is set near the top of the coil form and left there.
Change to a very weak signal (this may be done by loosely coupling the antenna lead to the antenna terminals) that produces a hiss in the sound. Adjust A12 and A13 for maximum sound and MINIMUM distortion. Adjust A14 for maximum undistorted sound. If sound is not clear at this point, repeat the above procedure as necessary.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Contrast fully clockwise.
Adjust the Fine Tuning until a strong 4.5MC beat pattern is visible.
Adjust A15 to find the two points at which the beat pattern is just noticeable on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.)

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6 & 15

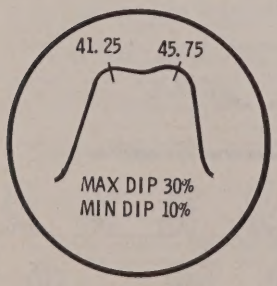


FIG. 1

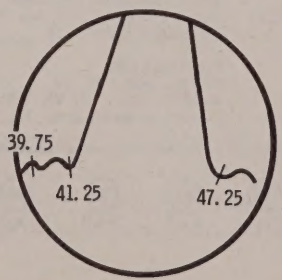


FIG. 2

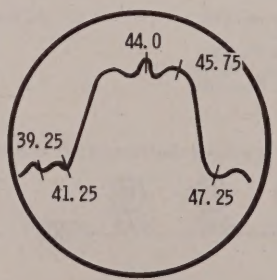


FIG. 3

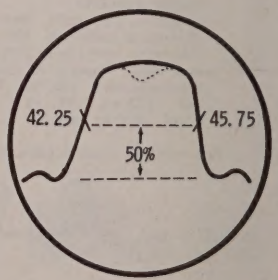
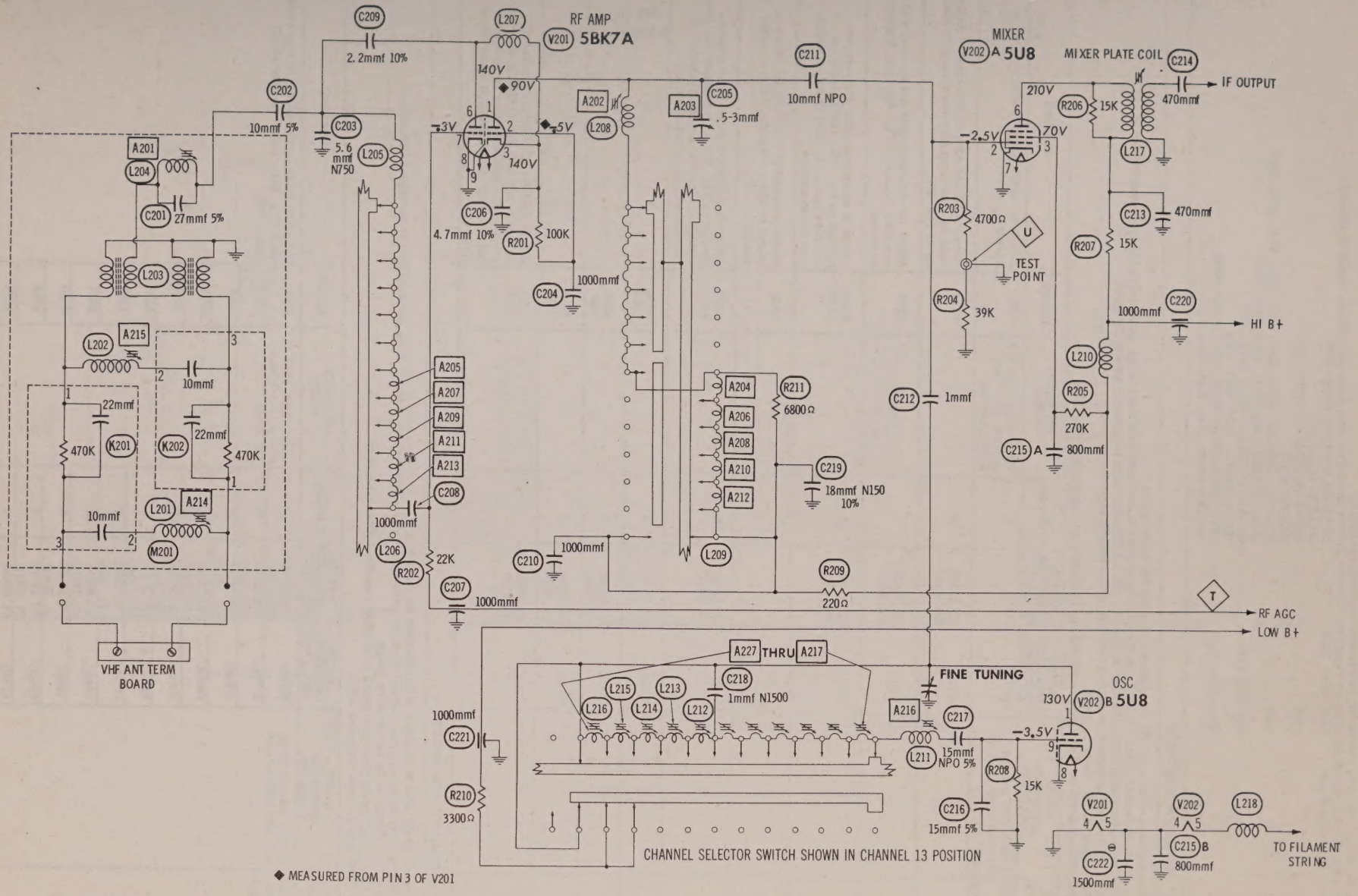


FIG. 4

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# VHF TUNER 1U747682 (LTT-104), 1U747639 (TT-104)

**MOTOROLA MODELS V17P5-1, -2, V17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B, M (Ch. LTS-430, TS-430, TS-430Y)**

PRE-ALIGNMENT INSTRUCTIONS

# TUNER ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRNASFORMER to PROTECT the Test Equipment.
Allow a 20 minute warm-up period for the receiver and test equipment.
Remove yoke plug to prevent interference radiation. Connect a 1500Ω 50 watt resistor from pin 1 of yoke socket to chassis.

Suggested Alignment Tools:

| | |
|---|---|
| A201, A214, A215 ..... | GENERAL CEMENT #9296, 9297<br>WALSCO #2546, 2547 |
| A202 ..... | GENERAL CEMENT #9050L, 9150<br>WALSCO #2521 |
| A203 ..... | GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290<br>WALSCO #2512, 2515, 2522, 2523, 2525, 2537 |
| A216 thru A227 ..... | GENERAL CEMENT #8291, 8294, 8607<br>WALSCO #2523, 2534, 2537, 2538 |
| Mixer Plate Coil ..... | GENERAL CEMENT #8282, 8606, 8606L, 9091<br>WALSCO #2526, 2541, 2543, 2544 |

## VHF RF AND MIXER ALIGNMENT

Connect a clip lead from point (T) to chassis. Remove the tuner shield.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | Two 120Ω Carbon Resistors | Across VHF antenna terminals with 120Ω in each lead. | 94MC | 94MC | 6 | Vert. Amp. thru 47K to point (U). Low side to chassis. | A201 | Adjust for MINIMUM response at 94MC marker. |
| 2. | " | " | 213MC | 211.25MC<br>215.75MC | 13 | " | A202 | Preset A202 and A203 to mid-range. Adjust A202 for maximum gain and symmetry similar to Fig. 201. |
| 3. | " | " | 177MC | 175.25MC<br>179.75MC | 7 | " | A203 | Adjust for maximum gain and symmetry of response similar to Fig. 201, with markers as shown. |
| 4. | " | " | 85MC | 83.25MC<br>87.75MC | 6 | " | A204,<br>A205 | Adjust in numerical order for response similar to Fig. 202. A204 places the markers on curve, A205 is for maximum gain and symmetry. |
| 5. | " | " | " | " | " | " | A201 | Readjust SLIGHTLY above point where it begins to affect response curve at sound marker. |
| 6. | " | " | 79MC | 77.25MC<br>81.75MC | 5 | " | A206,<br>A207 | Adjust in numerical order for response similar to Fig. 202. First adjustment places markers on curve, second adjustment is for maximum gain and symmetry. |
| 7. | " | " | 69MC | 67.25MC<br>71.75MC | 4 | " | A208,<br>A209 | " |
| 8. | " | " | 63MC | 61.25MC<br>65.75MC | 3 | " | A210,<br>A211 | " |
| 9. | " | " | 57MC | 55.25MC<br>59.75MC | 2 | " | A212,<br>A213 | " |
| 10. | " | " | 57MC | 43.5MC<br>45.5MC | " | " | A214,<br>A215 | Adjust A214 for MINIMUM response at 43.5MC, and A215 for MINIMUM response at 45.5MC. Retouch either or both for flat response with MINIMUM amplitude at marker. |

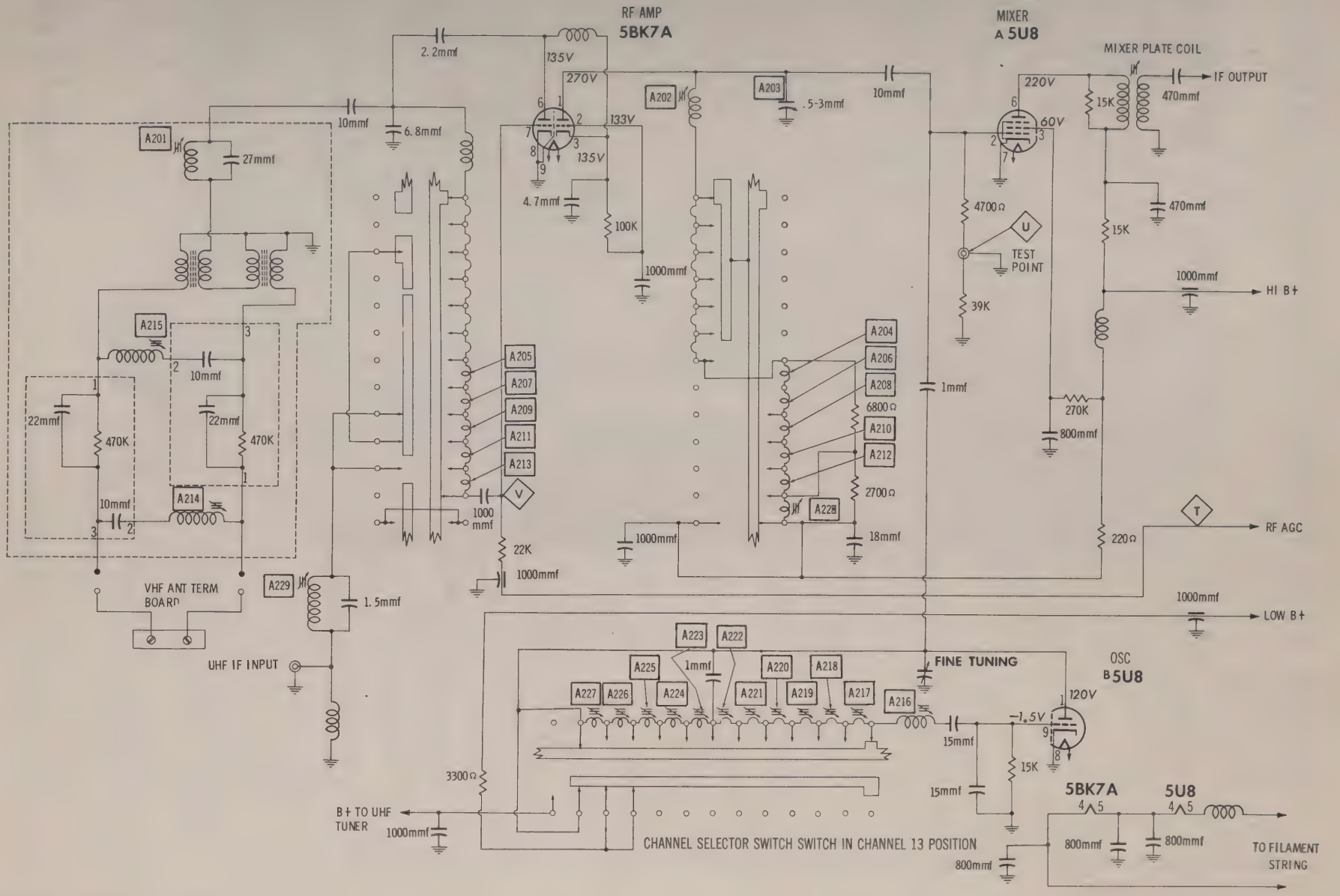
## VHF OSCILLATOR ALIGNMENT

The tuner shield must be in place when adjusting the oscillator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 11. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC | 211.25MC<br>215.75MC | 13 | Vert. Amp. thru 47K across Video Det. load | A216 | Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%. |
| | | | 207MC | 205.25MC<br>209.75MC | 12 | | A217 | |
| | | | 201MC | 199.25MC<br>203.75MC | 11 | | A218 | |
| | | | 195MC | 193.25MC<br>197.75MC | 10 | | A219 | |
| | | | 189MC | 187.25MC<br>191.75MC | 9 | | A220 | |
| | | | 183MC | 181.25MC<br>185.75MC | 8 | | A221 | |
| | | | 177MC | 175.25MC<br>179.75MC | 7 | | A222 | |
| | | | 85MC | 83.25MC<br>87.75MC | 6 | | A223 | |
| | | | 79MC | 77.25MC<br>81.75MC | 5 | | A224 | |
| | | | 69MC | 67.25MC<br>71.75MC | 4 | | A225 | |
| | | | 63MC | 61.25MC<br>65.75MC | 3 | | A226 | |
| | | | 57MC | 55.25MC<br>59.75MC | 2 | | A227 | |



continued PAGE 15

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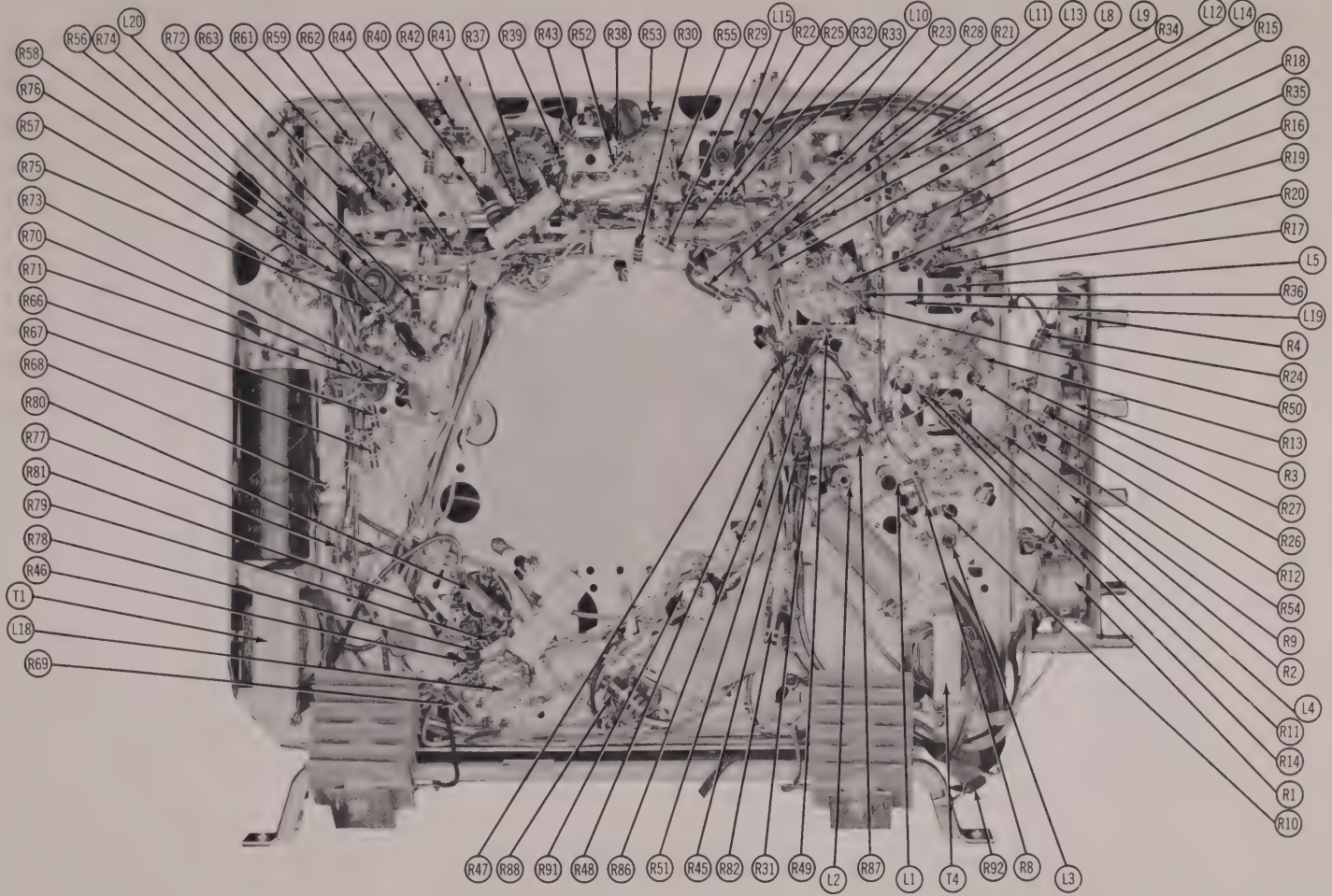
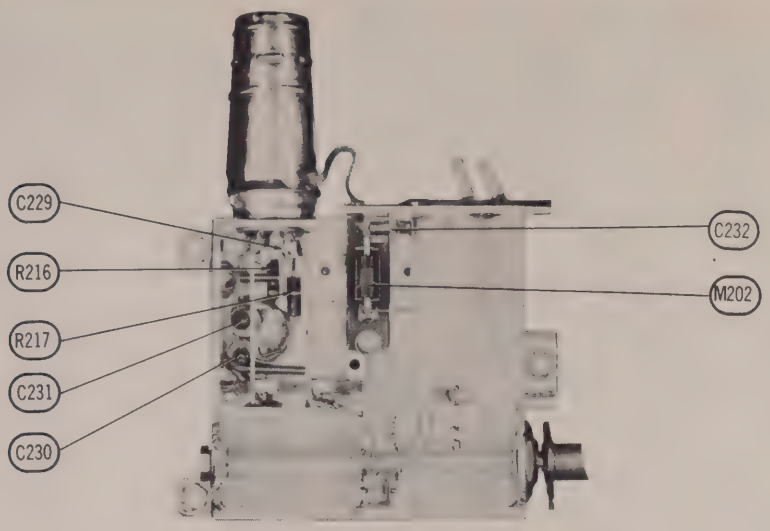
# VHF TUNER with UHF provisions 1U747653 (TT-104Y)

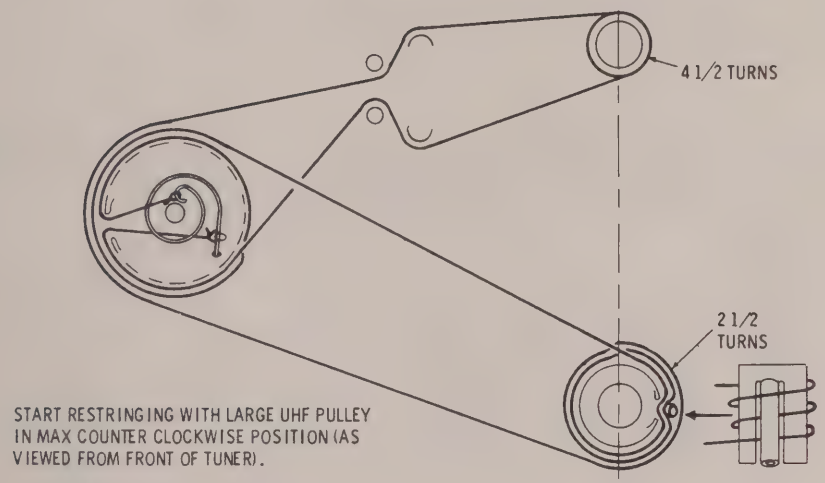
## MOTOROLA MODELS V17P5-1, -2, V17T32BZ, 17P5-1, -2, 17T32BZ, 17T3B, M (Ch. LTS-430, TS-430, TS-430Y)



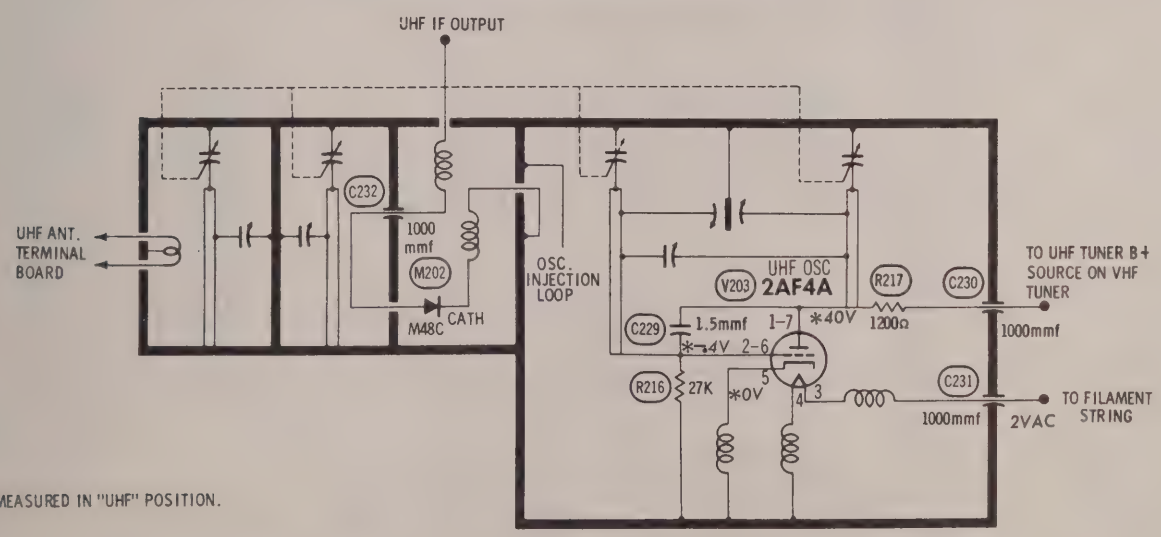

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION




UHF TUNER VTT-89


4 1/2 TURNS
2 1/2 TURNS
START RESTRINGING WITH LARGE UHF PULLEY IN MAX COUNTER CLOCKWISE POSITION (AS VIEWED FROM FRONT OF TUNER).

UHF DRIVE CORD STRINGING




* MEASURED IN "UHF" POSITION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER VTT-89

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA)

| ITEM No | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | 1st Video IF Amp | 3DZ8 | |
| V2 | 2nd Video IF Amp | 3DZ8 | |
| V3 | 3rd Video IF Amp | 3DZ8 | |
| V4 | Video Output | 6CU7 | |
| | Noise Cancelling | 6EH8 | |
| V5 | Aud. Keying Sync Sep | 6CU7 | |
| V6 | Sound IF Vert Mult | 6U8 | |
| V7 | Audio Det | 3DT8 | |

* Alternate

| ITEM No | USE | TYPE | NOTES |
|---|---|---|---|
| V8 | Audio Output | XL34, 6BQ5 | *9EJ5 |
| V9 | Vert Mult -Vert Output | 3AQ5 | |
| V10 | Horiz Mult | 6CU7 | |
| V11 | Horiz Output | 12DQ6A | |
| V12 | Damper | 1AF3 | |
| V13 | HV Rect | DY87, 1B3A | |

## PICTURE TUBE

| ITEM No | REPLACEMENT DATA: MOTOROLA PART No. | GENERAL ELECTRIC PART No. | RCA PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|
| V14 | 17CTP4 1/ 17BJP4 2/ | | 17BJP4 | 17CTP4 † 17BJP4 † | * "Riverama" ③ † "Silver Screen 85" |

1/ Chassis TS-430, Y  2/ Chassis LTS-430

## ELECTROLYTIC CAPACITORS

| ITEM No | RATING: CAP | VOLT | REPLACEMENT DATA: MOTOROLA PART No | ARROVOX PART No | CORNELL DUBILIER PART No | MALLORY PART No | PYRAMID PART No | SPRAGUE PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1 | 140 | 150 | 2XC745-88 | AFHS-23 | XA0281 | FP1L7 | TM3-24 | TVL-1426 | |
| C2A | 450 | 300 | 2XC737749 | AFHS4-02-75 | D0028 | FP4L8 55 | | TVL2-4587 1/ | |
| B | 450 | 300 | | | | | | | |
| C | 450 | 300 | | | | | | | |
| D | 10 | 200 | | | | | | | |
| C3 | 20 | 25 | 23C739296 1/ | PRS0V20 | BBR20-25 | TT25X20 | TD-25-25 | TVA-1410 | |

1/ Not used in some versions
* Not normally in distributor's stock  Available thru distributor on order to manufacturer

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd for Mica and Ceramic Capacitors

| ITEM No | RATING: CAP | VOLT | TOL | REPLACEMENT DATA: MOTOROLA PART No | AEROVOX PART No | CENTRALAB PART No | CORNELL DUBILIER PART No | MALLORY PART No | SPRAGUE PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C4 | 18 | | N150 10% | 21R120578 | | | | | | |
| C5 | 8.2 | | N150 ± 5mmf | 21R120547 | | | | | | |
| C6 | 10 | | N150 10% | 21R120586 | | | | | | |
| C7 | 56 | | N750 5% | 21R128699 | | | | | | |
| C8 | 1000 | | 10% | 21R117585 | BPD-001 | DD-102 | BYA10DIM | B-210 | 5HK-DI | |
| C9 | 1000 | | | 21R737426 | EF-001 | MFT-1000 | | | 503C-DI | |
| C10 | 1000 | | | 21R115385 | BP D-001 | DD-102 | BYA10DIM | B-210 | 5HK-DI | |
| C11 | 2.2 | | 10% | 21R115945 | NPO-SI 2.2 | DTZ-2R2 | CDDY2C | CHO-622 | 5TCCB-V22S 10%* | |
| C12 | 22 | | N150 10% | 21R120529 | | | | | | |
| C13 | 470 | | | 21R140121 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C14 | 470 | | | 21R140121 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C15 | 1000 | | | 21R115386 | BP D-001 | DD-102 | BYA10DIM | B-210 | 5HK-DI | |
| C16 | 1000 | | | 21R115386 | BP D-001 | DD-102 | BYA10DIM | B-210 | 5HK-DI | ① |
| C17 | 470 | | | 21C745781 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C18 | 470 | | | 21C745781 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C19 | 5.6 | | N150 ± 6mmf | 21R124490 | | | | | | |
| C20 | 4.7 | | N150 5% | 21R115954 | NPO-SI 4.7 | TCZ-4R7 | C20V47C | 2T-5547 | 5TCCB-V47S10%* | |
| C21 | 18 | | N150 10% | 21R120578 | | | | | | |
| C22 | 10 | | N150 10% | 21R12114 | | | | | | |
| C23 | 3.9 | | 10% | 21R115953 | | | | | 5TCCB-V39S10%* | |
| C24 | 5000 | | | 21R735298 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C25 | 02 | 300 | 10% | 54T593837 | V04C-S022 | DD-203 | DYM-2122 | DYM-47 | | ③ |
| C26 | 30 | | N150 10% | | | | | | | ② |
| C27 | 47 | | N150 10% | | | | | | | |
| C28 | 1 | 400 | | 21R12066 | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C29 | 5000 | 2000 | | 21R120093 | | D030-502 | HVC20D5 | GEM-3025 | 20HK-D5 | |
| C30 | 10000 | 1400 | | 21R124532 | DAC-27 | DD-103 | CUB4DS | 28V-110 | 20HKD-SI | |
| C31 | 20000 | | | 21R741852 | BPD-02 | DD-203 | BYB252 | B-130 | 5HK-S2 | |
| C32 | 5.6 | | NPO ± 5mmf | 21R12173 | | | | | 5TCCB-V56S ± 5mmf* | |
| C33 | 470 | | | 21R121478 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C34 | 25 | 100 | | 21R124570 | P288N-25 | | CUB2P25 | GEM-3025 | 2TM-P25 | |
| C35 | 25 | 100 | | 21R124570 | P288N-25 | | CUB2P25 | GEM-3025 | 2TM-P25 | |
| C36 | 1000 | | | 21R115388 | BP D-001 | DD-102 | BYA10DIM | B-210 | 5HK-DI | ① |
| C37 | 5000 | | | 21R735298 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C38 | 5000 | | | 21R735298 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C39 | 5000 | | | 21R735298 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C40 | 18 | | N150 10% | 21R120578 | | | | | | |
| C41 | 5000 | 1000 | | 21R735298 | DAC-9 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C42 | 470 | | | 21R140121 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C43 | 18 | | N150 10% | 21R120578 | | | | | | |
| C44 | 5000 | 1000 | | 21R735298 | DAC-9 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C45 | 10000 | | | 21R735700 | BPD-01 | DD-103 | BYA10SI | B-110 | 5HK-SI | |
| C46 | 10000 | | | 21R735700 | BPD-01 | DD-103 | BYA10SI | B-110 | 5HK-SI | |
| C47 | 5000 | 2000 | | 21R120093 | | D030-502 | HVC20D5 | GEM-3025 | 20HK-D5 | |
| C48 | 5000 | 2000 | | 21R120093 | | D030-502 | HVC20D5 | GEM-3025 | 20HK-D5 | |
| C49 | 10000 | | | 21R743726 | BPD-01 | DD-103 | BYA10SI | B-110 | 5HK-SI | |
| C50 | 5000 | | | 21R12371 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C51 | 470 | | | 21C745781 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C52 | 2000 | | | 21R141217 | BPD-002 | DD-102 | BYA10DIM | B-210 | 5HK-DI | |
| C53 | 2000 | | | 21R12106 | BPD-002 | DD-302 | BYA10D2 | B-220 | 5HK-D2 | |
| C54 | 2000 | | | 21R741883 | BPD-002 | DD-302 | BYA10D3 | GEM-1023 | 5HK-D33 | |
| C55 | 007 | 400 | 10% | 8K74231 | | | | GEM-1627 | | |
| C56 | 01 | 600 | 10% | 21R12285 | V84C-S6 | | P36S8 | GEM-1611 | 5TM-S | |
| C57 | 05 | 600 | | 21R12285 | P688N-05 | DF-503 | CUB5S8 | GEM-615 | 5TM-S5 | |
| C58 | 05 | 200 | | 21R12005 | P288N-05 | DF-503 | CUB2S8 | GEM-615 | 2TM-S5 | |
| C59 | 03 | 600 | | 21R12079 | P688N-03 | | CUB6S8 | GEM-612 | 5TM-S2 | |
| C60 | 1000 | 2000 | | 21R124458 | HVD-10-1000 | D030-102 | HVB20DI | 28V-210 | 20GA-DI | |
| C61 | 01 | 600 | | | P688N-01 | DF-103 | CUB6S8 | GEM-611 | 5TM-S | ④ |
| C62 | 10000 | | | 21R735700 | BPD-01 | DD-103 | BYA10SI | B-110 | 5HK-SI | ④ |
| C63 | 015 | 200 | 10% | 54T593820 | | | BYA10TM | GEM-3115 | 5TM-S15 | |
| C64 | 100 | | N750 10% | 21R140039 | N750-D8 100 | DYN-100 | C10T1U | CN7-110 | 9TCU-T10 10%* | |
| C65 | 100 | | N750 10% | 21R140039 | N750-D8 100 | DYN-100 | C10T1U | CN7-110 | 9TCU-T10 10%* | |
| C66 | 5300 | | | 21R120422 | BPD-0033 | DD-333 | BYA10D33 | B-333 | 5HK-D33 | |
| C67 | 5300 | | | 21R120422 | BPD-0033 | DD-332 | BYA10D33 | B-333 | 5HK-D33 | |

## CAPACITORS (cont)

| ITEM No | RATING: CAP | VOLT | TOL | REPLACEMENT DATA: MOTOROLA PART No | AEROVOX PART No | CENTRALAB PART No | CORNELL DUBILIER PART No | MALLORY PART No | SPRAGUE PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C68 | 2500 | | | 21R120422 | BPD-0033 | DD-333 | BYA10D33 | B-333 | 5HK-D33 | |
| C69 | 10000 | | | 21R121945 | BPD-01 | DD-103 | BYA10SI | B-110 | 5HK-SI | |
| C70 | 0039 | 600 | 10% | 8K25942 | | | DM5E6 | GTM-634 | 6TM-D4 | |
| C71 | 150 | | N750 10% | 21R121238 | N750-D8 150 | DYM-150 | C10T1SU | CN7-315 | 9TCU-T15S 10%* | |
| C72 | 680 | | 10% | 21R736148 | 3484-0068 | D6-68 | DM2F6S | | MS-168 | |
| C73 | 05 | 400 | | 21R121567 | P488N-05 | DF-503 | CUB4S8 | GEM-615 | 4TM-S5 | |
| C74 | 290 | | 10% | 21R746384 | DH 290 | D8-391 | CUB7S1 | MCM343 | 9GA-T39S 10%* | |
| C75 | 5000 | | | 21R735298 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C76 | 1 | 400 | | 21R12066 | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C77 | 1 | 600 | | 21R121614 | P688N-1 | DF-104 | CUB6P1 | GEM-601 | 6TM-P1 | |
| C78 | 1 | 600 | | 21R121569 | P688N-1 | DF-104 | CUB6P1 | GEM-601 | 6TM-P1 | |
| C79 | 05 | 1000 | | 21R12570 | P1088N-05 | | CUB10S8 | GEM-615 | 10TM-S5 | |
| C80 | 82 | 3000 | N750 10% | 21R120550 | | | | | | |
| C81 | 5000 | | | 21R738298 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | ① |
| C82 | 1000 | | | 21R115386 | BPD-001 | DD-102 | BYA10DIM | B-210 | 5HK-DI | |
| C83 | 1000 | | | 21R115386 | BPD-001 | DD-103 | BYA10DIM | B-210 | 5HK-DI | |
| C84 | 1000 | | | 21R115386 | BPD-001 | DD-103 | BYA10DIM | B-210 | 5HK-DI | |
| C85 | 15 | 400 | | 21R12274 | P488N-15 | | CUB4P15 | GEM-4015 | 4TM-P15 | |
| C86 | 1500 | | | 21R124121 | BPD-0015 | DD-153 | BYA10D15 | B-215 | 5HK-D15 | ① |
| C87 | 1500 | | | 21R737752 | BPD-0015 | DD-153 | BYA10D15 | B-215 | 5HK-D15 | |

1/ Not used in some versions.
2/ Chassis stamped A-05 and lower use .05mfd @ 300V 10% in this application (Part #21R115946).
3/ Some versions may use 27mmf N150 10% in this application (Part #21R115896).
4/ Some versions may use a single .02mfd @ 500V to replace C81 and C82 (Part #21R122079)
* Not used in chassis stamped A-01.
① Used in Ch. TS-430 only.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | WATTS | REPLACEMENT DATA: MOTOROLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 5meg | ½ | 18K747577 | B-78 | A47-2meg-Z | Q13-139 | TA38A | Volume |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | Not Req. | SWS-12 | 78-1 | UB-36 | OFF-On |
| R2A | 2meg | ½ | 18K740682 | B-75 | A47-2meg-B | Q13-139 | TA36L | Vert. Hold |
| B | Shaft | | | Not Req. | KBS-3 | Not Req. | Not Req. | |
| R3A | 100K | ½ | 18K740680 | B-40 | A47-100K-B | Q13-133 | TA35L | Brightness |
| B | Shaft | | | Not Req. | KBS-3 | Not Req. | Not Req. | |
| R4 | 30K | ½ | 18K748208 | | | | | Contrast, Tap @ 20K |
| R5 | 4meg | ½ | 18K747550 | | | | | Noise Gate (Sync Stab) |
| R6 | 70K | ½ | 18K740691 | | | | | Horiz. Hold |
| R7A | 2meg | ½ | 18B741530 | F1-67 | | †Q4-117 * | UB191 | Vert. Lin. |
| B | 5meg | | | R2-53 * | | | Not Req. | Vert. Height, Stop @ 1meg |

* Use 1meg resistor in series with left hand terminal of rear control.
† "Concentrikit" Equivalent: K-5 #31 with Base Elements & Shafts: BU-139, P9-021 (Panel) BU-141, RU-028 (Rear)

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No | RATING: OHMS | WATT | MOTOROLA PART No | NOTES |
|---|---|---|---|---|
| R8 | 2200Ω | 3 | 6R8290 | |
| R9 | 8200Ω | 3 | 17K738283 | |
| R10 | 47Ω | | 6K27542 | |
| R11 | 1000Ω | | 6K27060 | |
| R12 | 82000Ω | | 6K19631 | |
| R13 | 82000Ω | 3 | 17K738283 | |
| R14 | 47Ω | | 6K27542 | |
| R15 | 330K | | 6K28327 | |
| R16 | 1000Ω | | 6K27960 | |
| R17 | 47000Ω | | 6K31847 | |
| R18 | 82000Ω | 3 | 17K738283 | |
| R19 | 47K | 1 | | Note 1 |
| R20 | 1200 | | 6K28226 | |
| R21 | 2200Ω | | 6R8069 | |
| R22 | 1800Ω | | 6K32445 | |
| R23 | 47Ω | | 6K27542 | |
| R24 | 6800Ω | | 6K490359 | |
| R25 | 75000 | 3 | 17K746494 | |
| R26 | 100K | | 6K32534 | Note 3 |
| R27 | 100K | | 6K28534 | |
| R28 | 1000Ω | | 6K31301 | |
| R29 | 10K | | 6R6054 | |
| R30 | 68K | | 6R6001 | |
| R31 | 33K | | 6K31704 | |
| R32 | 33K | | 6K31704 | |
| R33 | 22K | | 6K19405 | |
| R34 | 1meg | | 6K32494 | |
| R35 | 5.6Ω 5% | | 6K28058 | |
| R36 | 0.2meg 5% | | 6R4114 | |
| R37 | 68K | | 6K28179 | |
| R38 | 330Ω | | 6K27940 | |
| R39 | 22K | | 6K31925 | |
| R40 | 18K | 3 | 6K49701 | |
| R41 | 390K | 1 | | |
| R42 | 82K | | 6K19179 | |
| R43 | 560K | | 6K28238 | |
| R44 | 560Ω | | 6K28302 | |
| R45 | 180Ω | 1 | | |
| R46 | 560K | | 6K28239 | |
| R47 | 2.2meg | | 6R9237 | |
| R48 | 1meg | | 6K32234 | |
| R49 | 47K | | 6K28359 | |
| R50 | 100K | | 6K28554 | |

| ITEM No | RATING: OHMS | WATT | MOTOROLA PART No | NOTES |
|---|---|---|---|---|
| R51 | 68K | | 6R6001 | |
| R52 | 18K | | 6K32948 | |
| R53 | 5.6meg | | 6K28781 | |
| R54 | 1meg | | 6K32234 | |
| R55 | 68K | | 6R6001 | |
| R56 | 15K | | 6K19694 | |
| R57 | 8200Ω | | 6K19931 | |
| R58 | 18K | | 6K32948 | |
| R59 | 470K | | 6K19408 | |
| R60 | 220K | | 6R6053 | |
| R61 | 22K | | 6K19935 | |
| R62 | 22K | | 6K19935 | |
| R63 | 150Ω | 1 | 6K28585 | |
| R64 | 560Ω | | 6K32802 | |
| R65 | 560Ω | | 6K32802 | |
| R66 | 100K | | 6K28534 | |
| R67 | 100K | | 6K28534 | |
| R68 | 22K | | 6K19935 | |
| R69 | 12Ω | 1 | 6K27508 | |
| R70 | 150K | | 6K32838 | |
| R71 | 4.7meg | | 6K32325 | |
| R72 | 82000 | | 6K19931 | |
| R73 | 1000Ω | | 6K21301 | |
| R74 | 39K | | 6K28535 | |
| R75 | 56K | | 6K32764 | |
| R76 | 2700Ω | | 6K19926 | |
| R77 | 68000 | | 6K19930 | |
| R78 | 1meg | | 6K32494 | |
| R79 | 470Ω | | 6K32535 | |
| R80 | 15K | 2 | 6K28578 | |
| R81 | 47Ω | 2 | 6K488035 | |
| R82 | 330K | | 6K19931 | |
| R83 | 6800Ω | 1 | 6K24699 | |
| R84 | 22K | | 6K28359 | |
| R85 | 47Ω | | 17K488256 | |
| R86 | 10K | 3 | 17K744464 | |
| R87 | 10000 | 3 | 17K537733 | |
| R88 | 27K | 2 | 6R3013 | |
| R89 | 7.5Ω | | 17K744240 | |
| R90 | 175Ω Cold 160 Hot | | 6K747398 | |
| R91 | 350 Ω | 15 | 17B739219 | Note 3 |
| R92 | 2.2meg | | 6R9237 | Note 4 |

Note 1: Not used in some versions
Note 2: Chassis stamped A-02 and lower use 220K in this application (Part #6K122322).
Note 3. Some versions may use 250 Ω, 15W in this application (Part #17K747736).
Note 4. Used in Ch. TS-430 only.

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | MOTOROLA PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| X3 | Video Output Grid | 4700mmf, 6SK | ① | Sprague PRC-6 |

① Not used in some versions.

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA: MOTOROLA PART No | Meissner PART No | Merit PART No | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| L2 | 47.25MC Trap | 24C747584 | 20-1049 | TV-183 ▲ | | | |
| L3 | 39.75MC Trap | 24C747583 | 20-1046 * | TV-182 | | | |
| L3A | 1st Video IF | 24K747686 | | | | | |
| B | 41.25MC Trap | | | | | | |
| L4A | 2nd Video IF | 24K747878 | | | | | |
| B | 47.25MC Trap | 24K747587 | | | | | |
| L5 | 2nd Video IF | 24K747587 | 17-4822 | TV-180 | 5819 | VF-3 | Encloses M5 |
| L6 | 4th Video IF | 24D748784 | | | | | 85.5 Microhenries |
| L7 | Resonant Choke | 24K121859 | | | | | 9.5 Microhenries |
| L8 | Resonant Choke | 24K121859 | | | | | 1.6 Microhenries ↕ |
| L9 | Resonant Choke | 24K748772 | | | | | 330 Microhenries |
| L10 | Shunt Peaking Coil | 24K740147 | 19-3320 | TV-300 | 8132 | VP-7 | 600 Microhenries ③ |
| | Shunt Peaking Coil | 24K746872 | 19-3500 | TV-304 | 8174 | VP-8 | |
| L11 | 4.5MC Trap | 24K735290 | 20-1004 | TV-181 | 5469 ▲ | SF-3 | |
| L12 | Series Peaking Coil | 24K740613 | 19-1330 ▲ | TV-186 ▲ | 8161 ■ | VP-8 ■ | 340 Microhenries, Includes 5600Ω resistor |
| | Series Peaking Coil | 24K746238 | 19-4100 ▲ | TV-196 ▲ | 8130 ▲ | | 180 Microhenries, Includes 15K resistor ② |
| L13 | Shunt Peaking Coil | 24K740117 | 19-3320 | TV-300 | 8132 | VP-7 | 330 Microhenries ③ |
| L14 | Resonant Choke | 24K743727 | | | | | 7.5 Microhenries ③ |
| L15 | 1st Sound IF | 24K746853 | 17-3408 | | 5470 | | Trapped ▲ 1.4Ω |
| L16 | 2nd Sound IF | 24K738943 | 17-3496 ▲ | TV-113 ▲ | 8203 ▲ | SF-2 ▲ | |
| L17 | Quadrature Coil | 24K748416 | | | | | |
| L18 | RF Choke | 24K743727 | | | 6811 | | 7.5 Microhenries ③ |
| L19 | I.F. Choke | 24K743675 | 19-1001 | BC-542 | 6804 | | 2.5 Microhenries |

① IRC Part #CLA
② Used in chassis coded A-05 and below.
③ Not used in chassis coded A-06 and below. ▲ Disregard tap.

* Remove cap. furnished and use original cap.
■ Parallel with 5600Ω resistor
▲ Parallel with 15K resistor
▲ Remove C60 (18mmf).

## TRANSFORMER (HORIZ. OSC.)

| ITEM No. | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: MOTOROLA PART No | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | Thordarson PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| L20 | 35Ω | | 24K741065 | | TV-163 | 8320 | H-102 | RS-5 | Horiz. Freq. |

## FILTER CHOKE

| ITEM No. | RATINGS: CURRENT (Measured) | DC RES. | INDUCTANCE (Ω CURRENT 120 ~) | REPLACEMENT DATA: MOTOROLA | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| L21 | 290A | 26Ω | .8 Hy. | 25K745919 | 26C44 | | | C-3325 | 26C44 | C-47X ① |

① Drill new mounting hole.

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA: MOTOROLA PART No | Halldorson PART No. | Merit PART No. | Ram PART No. | Regency PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | Vert. Output | 25K747597 | 26S77 ① | A-3853 ② | V316 ③ | VO36 ③ | A-8148 ③ | 26S77 ① | A-102X |
| T2 | Yoke-Horiz. (24MdB (90°)-Vert. (60MdB) | 24K747493 | Y-15 ③ ④ | MDF-97 ③ ④ | MC-8 | | | Y-15 ③ ④ | Y-45-1 |
| | Rear Cover & Centering Device | | 59CT2145 | | | | | | YC-1 |
| | Yoke Retainer | 42A738257 | | | | | | | CL-1 |
| | Retainer Clamp | 42A738178 | | | | | | | |
| T3 | Horiz. Output | 24K748346 ⑤ | | | | | | | |
| | Primary Coil | 24K745251 | | | | | | | |
| | Secondary Coil | 24K748349 | | | | | | | |

① Connect as autoformer.
② Cut and tape green lead.
③ Use original rear cover and centering device. Use original leads and plug. Connect same as original.
④ Use original horizontal yoke damping capacitor, if necessary.
⑤ Remove jumper from yoke terminals 6 and 64.
① Complete transformer assembly.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA: MOTOROLA PART No. * | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T4 | 8000Ω | 3-4Ω | 25K748245 | 34S68 | A-3026 | AU-601 | A-3877 | 24S68 | S-5X | |

## SPEAKER

| ITEM No. | TYPE: SIZE | FIELD | V. C. IMP. | REPLACEMENT DATA: MOTOROLA PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 4" | PM | 3-4Ω | 50K746811 | 4A1 | |

## RECTIFIERS

| ITEM No. | RATING: CURRENT (Measured) | MOTOROLA PART No | REPLACEMENT DATA: FEDERAL PART No | INTERNATIONAL PART No. | SARKES TARZIAN PART No. | NOTES |
|---|---|---|---|---|---|---|
| M1 | .290A | 48K132479 | 1341AH ① HA504 ② | T350 ① TV500 ② | 350A ① 40K ② | ① Selenium Type. ② Silicon Type. |
| M2 | .290A | 48K132479 | 1341AH ① HA504 ② | T350 ① TV500 ② | 350A ① 40K ② | ③ Two required. |
| M3 | | 48K741255 | K1815 ① | SD-91 ②③ | | |

MOTOROLA MODELS Y17T25-1, -2, Y17T32BZ, 17T32B, M (Ch. LTS-430, TS-430, TS-430Y).

FOLDER 1.

# PARTS LIST AND DESCRIPTIONS (Con't)

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | MOTOROLA PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M4 | N | 1.6A 125V S/B | 65K744238 | 9K744239 | 33301.6 (N-1 6/10A-125V-S/B) | 346016 | N 1 6/10 | HN 1 3/10 to 1 3/4 |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|
| | | MOTOROLA PART No. | CBS PART No. | SYLVANIA PART No. | |
| M5 | Clevite 824 | 48K747380 | 1N60 | 1N295 | Video Det. (Clip-in) |

## MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M6 | Tuner | 1U747639 | VHF (TT-104) Ch. TS-430 |
| | Tuner | 1U747682 | VHF (LTT-104), Ch. LTS-430 |
| | Tuner | 1U747653 | VHF with UHF provisions (TT-104Y) Ch. TS-430Y |
| | Tuner | | UHF (VTT-89) Ch. TS-430Y |

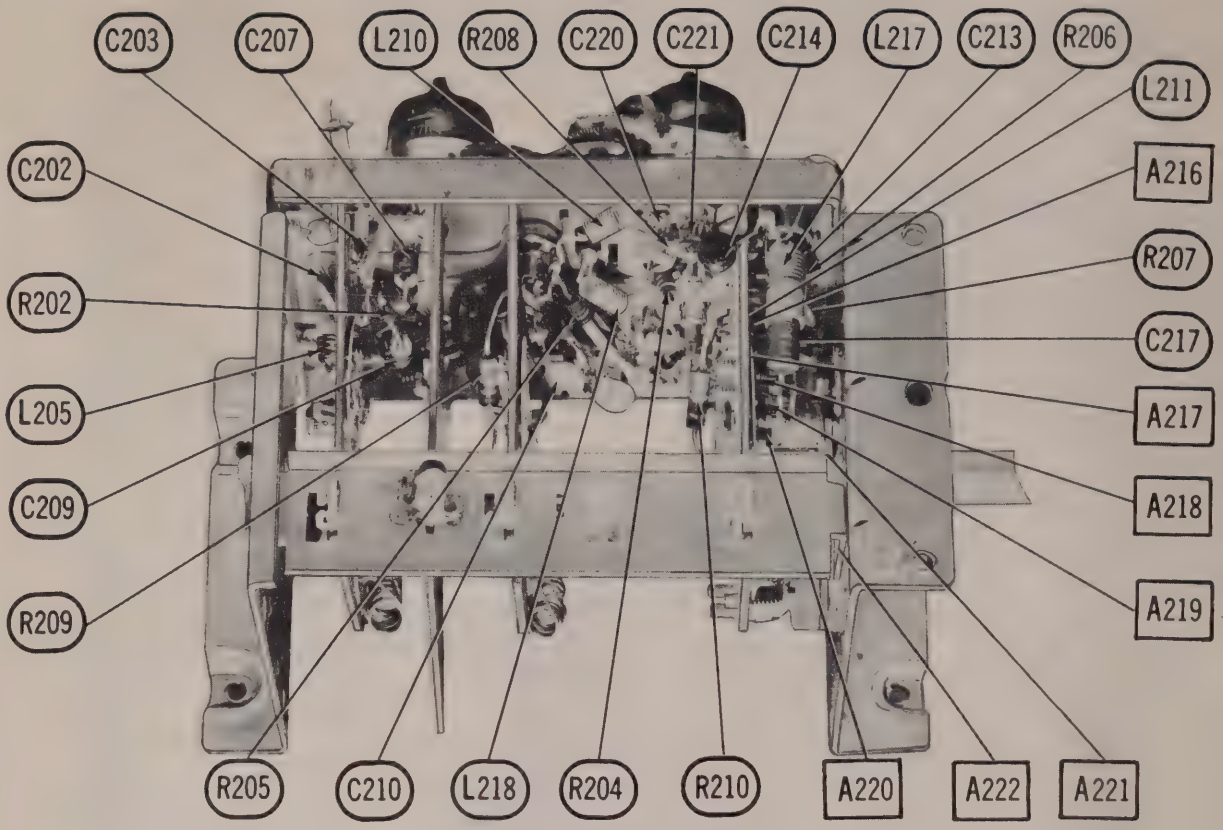
## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

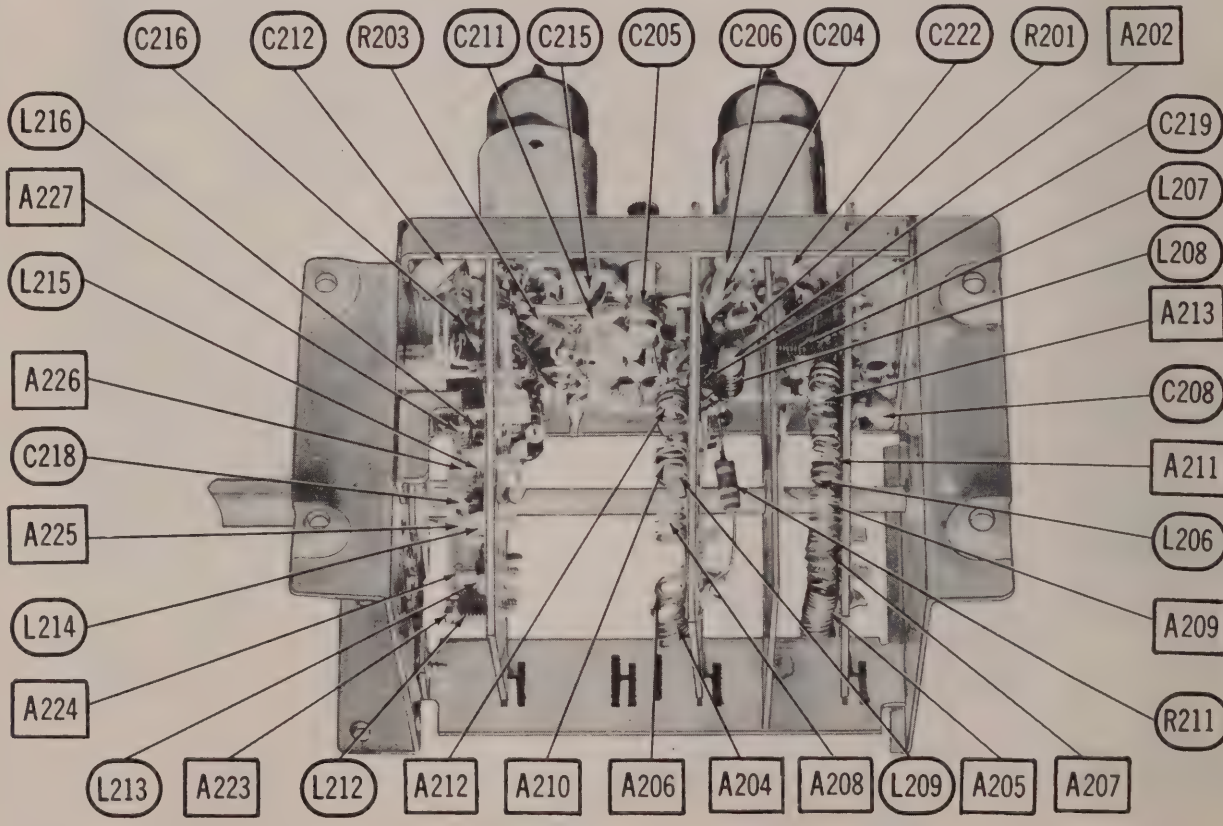
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Safety Glass | 61K747395 | Models 17T32BZ, Y17T32BZ, 17P5-1,-2, & Y17P5-1,-2 |
| Safety Glass | 61K747457 | Models 17T33B, W |
| Mask | 13D747449 | Model 17T33B, W |
| Bezel | 13K747407 | Models 17T32BZ, Y17T32BZ |
| Bezel | 13K749288 | Models 17P5-1, -2, Y17P5-1, -2 |
| Knob | 36C746582 | Channel Selector, Models 17T32BZ, 17P5-1,-2, 17T33B, W |
| Knob | 36K746583 | Channel Selector, Models Y17T32BZ, Y17P5-1, -2 |
| Knob | 36C738680 | Fine Tuning |
| Knob | 36K747405 | Off-On-Volume |
| Knob | 36B747402 | Brightness |
| Knob | 36K747404 | Contrast |
| Handle | 55B749214 | Models 17P5-1, -2, Y17P5-1, -2 |
| Cabinet | 16F747409 | Models 17T32BZ, Y17T32BZ |
| Cabinet | 16K749286 | Models 17P5-1, Y17P5-1 |
| Cabinet | 16K749287 | Models 17P5-2, Y17P5-2 |
| Cabinet | 16K747604 | Model 17T33B |
| Cabinet | 16K747605 | Model 17T33W |

## WIRING DATA

| | | |
|---|---|---|
| High Voltage Lead | Use BELDEN No. | 8869 |
| Shielded Hook-up Wire | Use BELDEN No. | 8885 (Single Conductor) |
| | | 8738 (Two Conductor) |
| General-use Unshielded Hook-up Wire | Use BELDEN No. | 8530 (Solid) Available in Ten Colors |
| | | 8524 (Stranded) Available in Ten Colors |
| Power Cord (Interlock Type) | Use BELDEN No. | 8874 |
| 300Ω Tuner Input Lead | Use BELDEN No. | 8225 |
| 300Ω Antenna Lead-in | Use BELDEN No. | 8230 or 8275 |
| Antenna Rotor Cable | Use BELDEN No. | 8464 (Flat) or 8484 (Round) - 4 Conductor |
| | | 8485 (Round) - 5 Conductor |
| | | 8488 (Round) - 8 Conductor |




TUNER 1U747639-LEFT SIDE




TUNER 1U747639-RIGHT SIDE

# TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. Use only enough sweep generator output to provide a usable pattern on scope.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 12. | 50Ω Carbon Resistor | High side to point ◇V◇. Low side to chassis. | 44MC | 41.25MC<br>45.75MC | UHF | Vert. Amp. thru 47K to point ◇U◇. Low side to chassis. | A228 | Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown. |
| 13. | Disconnect sweep generator and short antenna terminals. | | | | " | USE VTVM Across Video Det. load. | A229 | Adjust for maximum DC noise voltage. |

UHF ALIGNMENT FOR TUNER VT-89

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

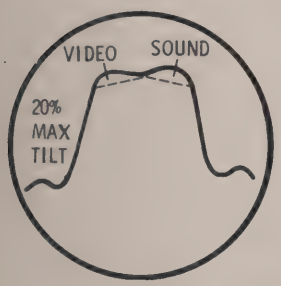


FIG. 201

FIG. 202

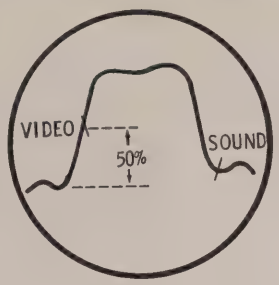
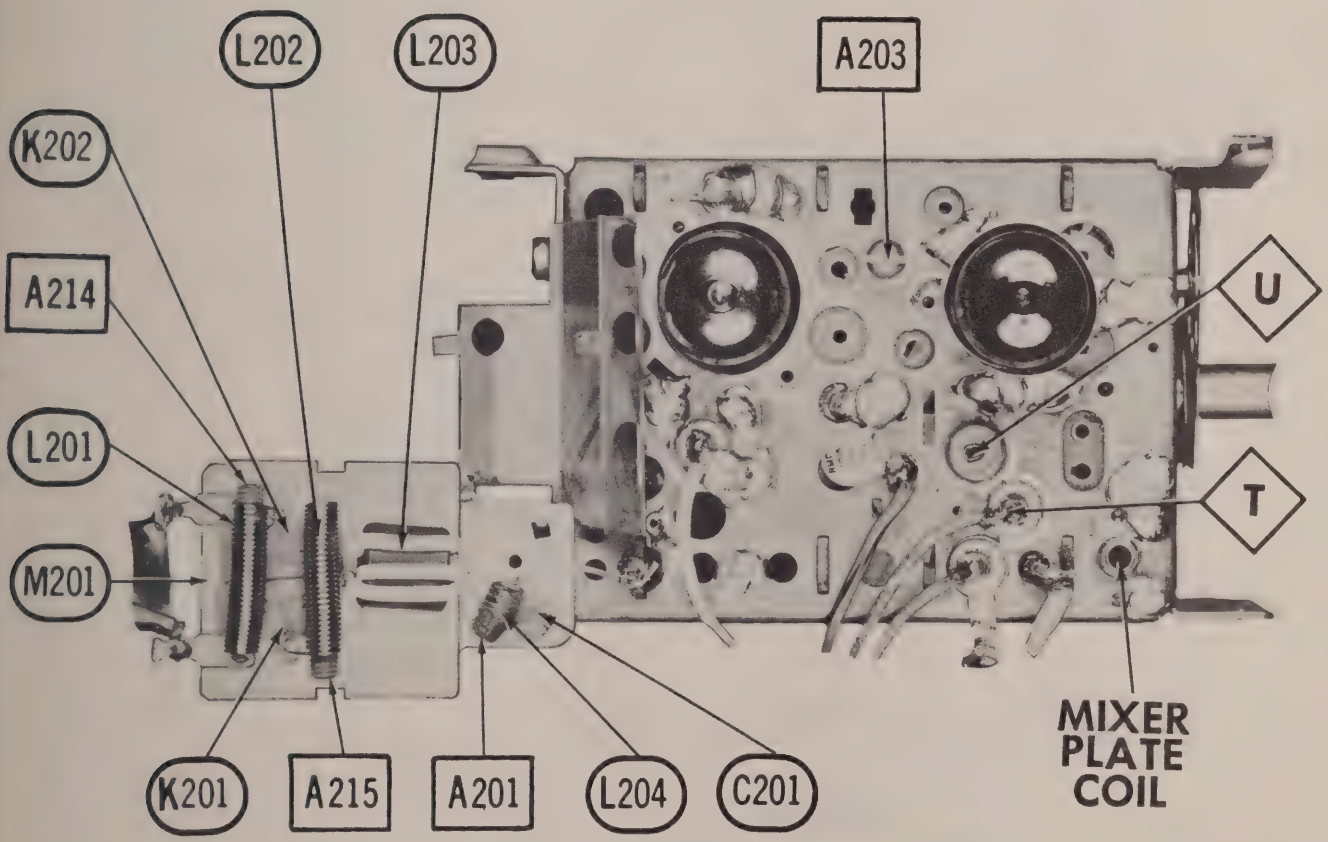


FIG. 203

FIG. 204




TUNER 1U747639 —TOP VIEW

# TUNER PARTS LIST AND DESCRIPTIONS

## 1U747639

### TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V201 | RF Amp. | 5BK7A | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V202 | Mixer-Osc. | 5U8 | |

### FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | MOTOROLA PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C201 | 27 | | 21R122050 | | | C10Q27C | CNO-427 | 5TCCB-Q27S 5%* | 5% |
| C202 | 10 | | 21R125698 | NPO-DI 10 | DTZ-10 | C10Q1C | CNO-410 | 5TCC-Q1S 5%* | 5% |
| C203 | 5.6 | | 21R121154 | | | | | 5TCUB-V56S * | N750 |
| C204 | 1000 | | 21R115386 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C205 | .5-3 | | 21K735985 | | 829-3 | | | | |
| C206 | 4.7 | | 21R115954 | NPO-SI 4.7 | TCZ-4R7 | CTA6V47C | CNO-547 | 5TCCB-V47S10%* | 10% |
| C207 | 1000 | | 21K739920 | EF-001 | MFT-1000 | | | 503C-D1 | |
| C208 | 1000 | | 21R115386 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C209 | 2.2 | | 21R115948 | NPO-SI 2.2 | TCZ-2R2 | CTA6V22C | CNO-522 | 5TCCB-V22S10%* | 10% |
| C210 | 1000 | | 21R115386 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C211 | 10 | | 21R124579 | NPO-DI 10 | DTZ-10 | C10Q1C | CNO-410 | 5TCC-Q1 | NPO |
| C212 | 1 | | 21R114071 | NPO-SI 1.0 | TCZ-1 | | CNO-510 | 5TCCB-V1 | |
| C213 | 470 | | 21R114554 | BPD-00047 | DD-471 | L10T47 | B-347 | 5GA-T47 | |
| C214 | 470 | | 21R114554 | BPD-00047 | DD-471 | L10T47 | B-347 | 5GA-T47 | |
| C215A | 800 | | 21K747024 | BPD-0008 | DD-801 | L10T8 | B-210 | 5GA-T8 | |
| B | 800 | | | BPD-0008 | DD-801 | L10T8 | B-210 | 5GA-T8 | |
| C216 | 15 | | 21R128077 | NPO-DI 15 | DTZ-15 | C10Q15C | CNO-415 | 5TCC-Q15S 5%* | 5% |
| C217 | 15 | | 21R125066 | NPO-DI 15 | DTZ-15 | C10Q15C | CNO-415 | 5TCC-Q15S 5%* | NPO 5% |
| C218 | 1 | | 21R124552 | | | | | | N1500 |
| C219 | 18 | | 21R120578 | | | | | | N150 10% |
| C220 | 1000 | | 21K739920 | EF-001 | MFT-1000 | | | 503C-D1 | |
| C221 | 1000 | | 21K739920 | EF-001 | MFT-1000 | | | 503C-D1 | |
| C222 | 1500 | | 21K738752 | BPD-0015 | D-152 | BYA10D15 | B-215 | 5HK-D15 | ① |

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Some versions may use 1000mmf in this application (Part #21R115386).

### RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | MOTOROLA PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R201 | 100K | | 6K122313 | |
| R202 | 22K | | 6K119405 | |
| R203 | 4700Ω | | 6K121847 | |
| R204 | 39K | | 6K125535 | |
| R205 | 270K | | 6R6414 | |
| R206 | 15K | | 6K119934 | |

| ITEM No. | RATING | | MOTOROLA PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R207 | 15K | | 6K119934 | |
| R208 | 15K | | 6K119934 | |
| R209 | 220Ω | | 6K125471 | |
| R210 | 3300Ω | | 6K121725 | |
| R211 | 6800Ω | | 6K119930 | |

### COILS (RF-IF)

| ITEM No. | USE | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| L201 | IF Trap Coil | 24B747530 † | |
| L202 | IF Trap Coil | 24B747530 † | |
| L203 | Ant. Trans. | 24B747543 † | |
| L204 | FM Trap Coil | 24B747801 † | |
| L205 | Ant. Coil | 24B744031 | Channel 13 |
| L206 | Ant. Coil | 24K748043 | Channel 2 - 6 |
| L207 | RF Choke | 24A739397 | |
| L208 | RF Coil | 24A739361 | Channel 13 |
| L209 | RF Coil | 24K740465 | Channel 2 - 6 |

| ITEM No. | USE | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| L210 | RF Choke | 24K743529 | |
| L211 | Osc. Coil | 24K746879 | Channel 13 |
| L212 | Osc. Coil | 24K739385 | Channel 6 |
| L213 | Osc. Coil | 24K739384 | Channel 5 |
| L214 | Osc. Coil | 24C739381 | Channel 4 |
| L215 | Osc. Coil | 24K739382 | Channel 3 |
| L216 | Osc. Coil | 24C739381 | Channel 2 |
| L217 | Mixer Plate | 24B747599 | |
| L218 | Fil. Choke | 24K743530 | |

† Part of M201, Part #1V747644.

### COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | MOTOROLA PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K201 | Antenna Filter | 10mmf, 22mmf, 470K | 51C747535 | |
| K202 | Antenna Filter | 10mmf, 22mmf, 470K | 51C747535 | |

### MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M201 | Antenna Network | 1V747644 | High Pass Filter Assembly, Complete |

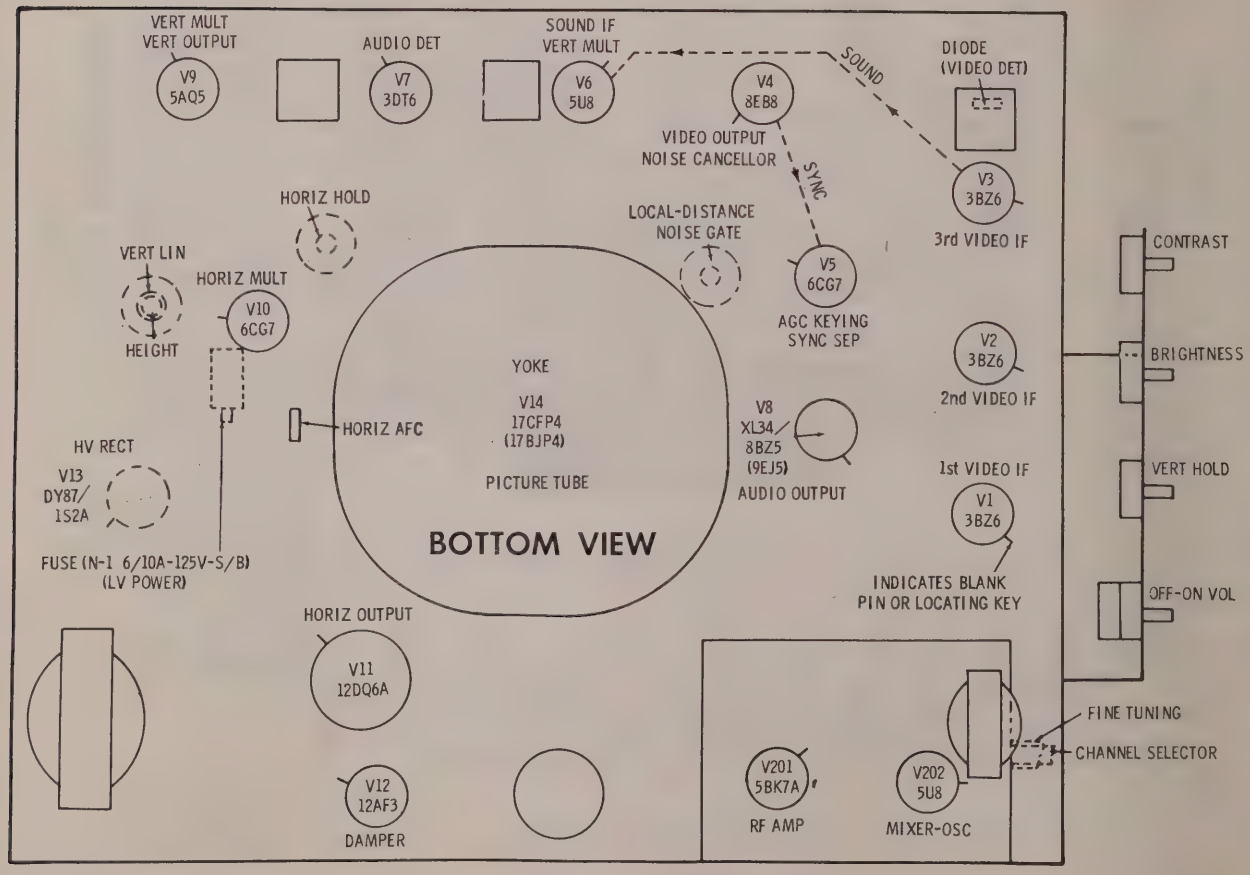
| | | | | | |
|---|---|---|---|---|---|
| TP1 | 125V | 1st VIDEO IF SCREEN | TP5 | 245V | HORIZ MULT B+ |
| TP2 | 0V | 3rd VIDEO IF GRID | TP6 | 0V | GROUND |
| TP3 | -.1.2V | VIDEO OUTPUT GRID | TP7 | .2V | HORIZ AFC |
| TP4 | -.1V | IF AGC | TP8 | 265V | B+ |

CHASSIS TOP VIEW

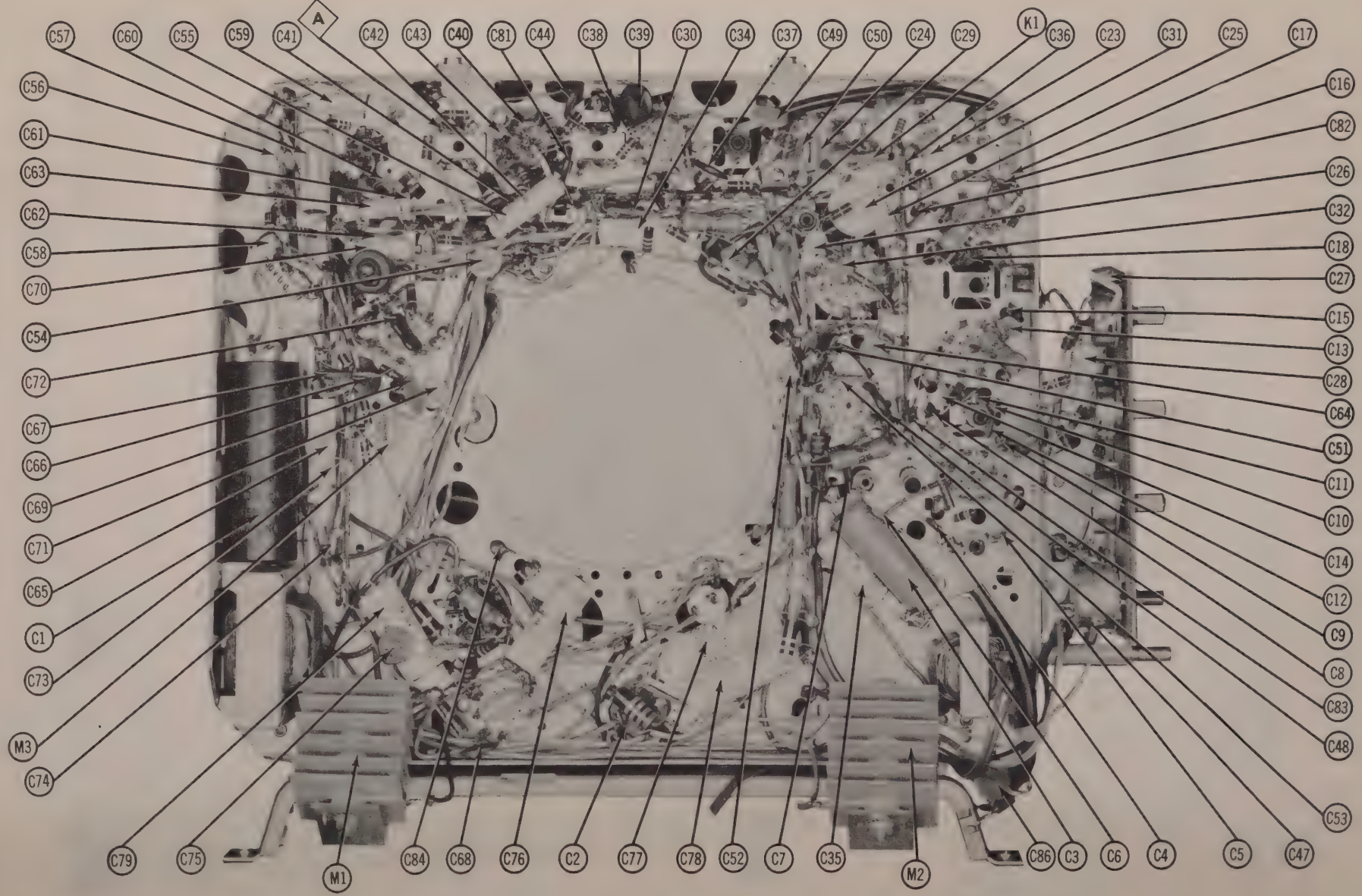
# RESISTANCE MEASUREMENTS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 3BZ6 | 330K | 47Ω | 13.5Ω | 13Ω | †8200Ω | †8200Ω | 0Ω | | | |
| V2 | 3BZ6 | 330K | 47Ω | 13Ω | 12.5Ω | †8200Ω | †8200Ω | 0Ω | | | |
| V3 | 3BZ6 | 1000Ω | 120Ω | 12.5Ω | 12Ω | †8200Ω | †47K | 0Ω | | | |
| V4 | 8EB8 | 1800Ω | ● 1.7meg | †30K | 12Ω | 10Ω | 47Ω | 72K | †27K | †7500Ω | |
| V5 | 6CG7 | 1.3meg | †40K | †2700Ω | 5Ω | 4Ω | †50K | 3.2meg | 0Ω | 0Ω | |
| V6 | 5U8 | ●†2.3meg | 2.6Ω | †100K | 6.5Ω | 7.5Ω | †40K | 330Ω | 0Ω | ● 6meg | |
| V7 | 3DT6 | 8Ω | 560Ω | 2Ω | 2.5Ω | †390K | †19K | 560K | | | |
| V8 | XL34/ 8BQ5 | 0Ω | 0Ω | 180Ω | 8.5Ω | 10Ω | NC | †1300Ω | NC | †1000Ω | |
| V9 | 5AQ5 | ● 1.3meg | 0Ω | 7.5Ω | 8.5Ω | †600Ω | †150Ω | ● 1.3meg | | | |
| V10 | 6CG7 | †58K | ●50K | 1000Ω | 4Ω | 2.5Ω | †11K | 5meg | 1000Ω | 0Ω | |
| V11 | 12DQ6A | TP | 13.5Ω | NC | †15K | 1meg | TP | 15Ω | 47Ω | TOP CAP †14Ω | |
| V12 | 12AF3 | NC | TP | TP | 15Ω | 17Ω | NC | TP | TP | †3.2Ω | TOP CAP 6 MEG |
| V13 | DY87/ 1S2A | PINS 1 THRU 8 HAVE INFINITE RESISTANCE | | | | | | | | TOP CAP ¶190Ω | |
| V14 | 17CFP4 | 6.5Ω | 78K | Pin 6 †33K | Pin 10 †33K | Pin 11 ●120K | Pin 12 5Ω | | | | |
| V201 | 5BK7A | †220Ω | INF | INF | 0Ω | 1Ω | INF | 1.7meg | 0Ω | 0Ω | |
| V202 | 5U8 | †13K | 44K | †270K | 11Ω | 2Ω | †15K | 0Ω | 0Ω | 15K | |
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE. NC NO CONNECTION.
‡ MEASURED FROM TOP CAP OF V12. TP TIE POINT.




# TUBE PLACEMENT CHART




**CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION**

PHOTOFACT* Folder

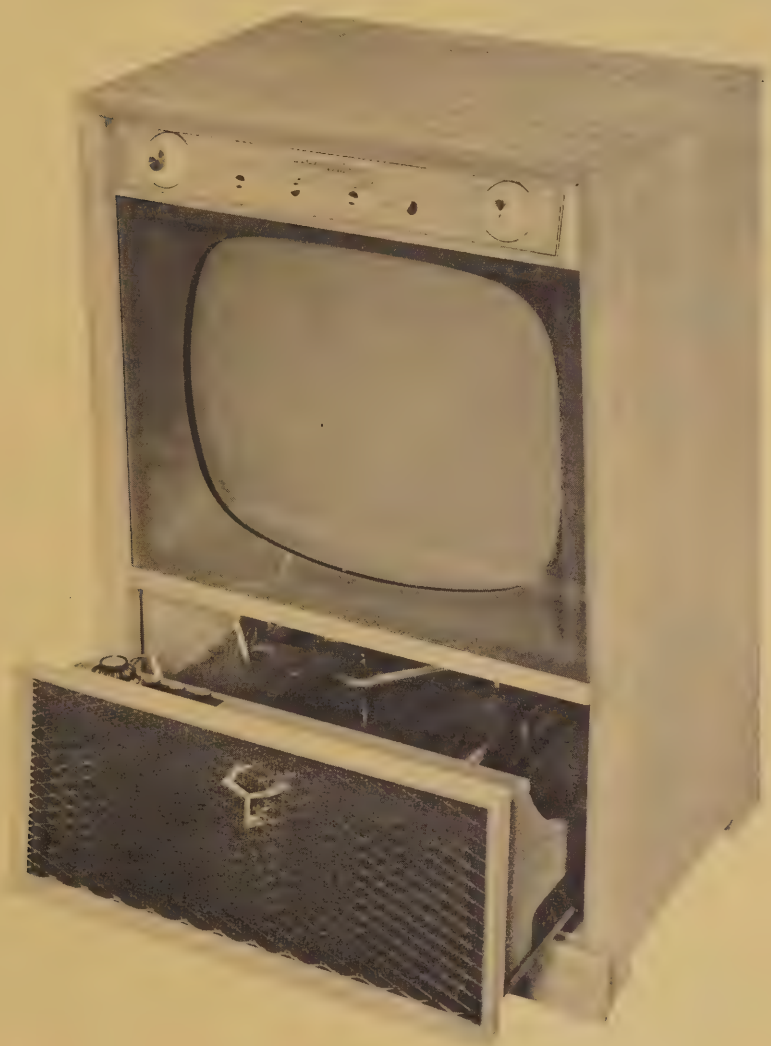


## IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

SETCHELL-CARLSON MODELS
21C159, 21L159, 24C159, 24L159,
27C159, 27L159 (Ch. Z159, 159)



MODEL 21C159 (Ch. 159)

SETCHELL-CARLSON MODELS
21C159, 21L159, 24C159, 24L159,
27C159, 27L159 (Ch. Z159, 159)

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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SET 445 FOLDER 2

**SETCHELL-CARLSON MODELS**
**21C159, 21L159, 24C159, 24L159,**
**27C159, 27L159 (Ch. Z159, 159)**

# DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 21C159

1. Remove 8 push-on type knobs from the front.
2. Remove 3 metal bolts holding cabinet lid at the front. Raise cabinet lid.
3. Remove 4 screws holding rear cover. Remove the rear cover.
4. Remove 1 wood screw holding rear picture tube door.
5. Remove 6 chassis plugs, picture tube socket and HV lead.
6. Remove antenna terminal board.
7. Remove 2 wood screws holding TV chassis at the rear. Remove TV chassis from the rear.
8. Pull Record Changer compartment out. Lift front of the drawer and remove from the cabinet.
9. Remove 5 push-on type knobs.
10. Remove phono plug.
11. Remove 1 wood screw holding chassis at the bottom. Remove chassis.

MODEL 21C159 (Ch. 159)

SETCHELL-CARLSON MODELS
21C159, 21L159, 24C159, 24L159,
27C159, 27L159 (Ch. Z159, 159)

| | | | |
|---|---|---|---|
| TRADE NAME | Setchell-Carlson | MODELS | CHASSIS |
| | | 21C159, 21L159, 24C159, 24L159, 27C159, 27L159 ..... | 159 |
| | | 21C159, 21L159, 24C159, 24L159, 27C159, 27L159 ..... | Z159 |
| MANUFACTURER | Setchell-Carlson Inc., New Brighton, Minn. | | |
| TYPE SET | Combination Television Receiver, AM, FM, Phono & Stereo Amp | | |
| TUBES | TV: Twenty-three, AM: Three, FM: Four, Stero Amp: Three | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycle | RATING | TV 160 Watts, 1.52 Amp. @ 117 Volts AC<br>AM 52 Watts, .57 Amp. @ 117 Volts AC<br>FM-AM 85 Watts, .88 Amp. @ 117 Volts AC<br>Phono 40 Watts, .46 Amp. @ 117 Volts AC |
| TUNING RANGE | TV Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)<br>AM 535-1600KC, IF 456KC<br>FM 88-108MC, IF 10.7MC | | |

FOR SERVICE INFORMATION ON RECORD CHANGER SEE SIMILAR UNIT IN PHOTOFACT SET 436 FOLDER 18.

# SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 screws holding the trim strip at the bottom edge of the safety glass. Tilt glass out and remove.

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

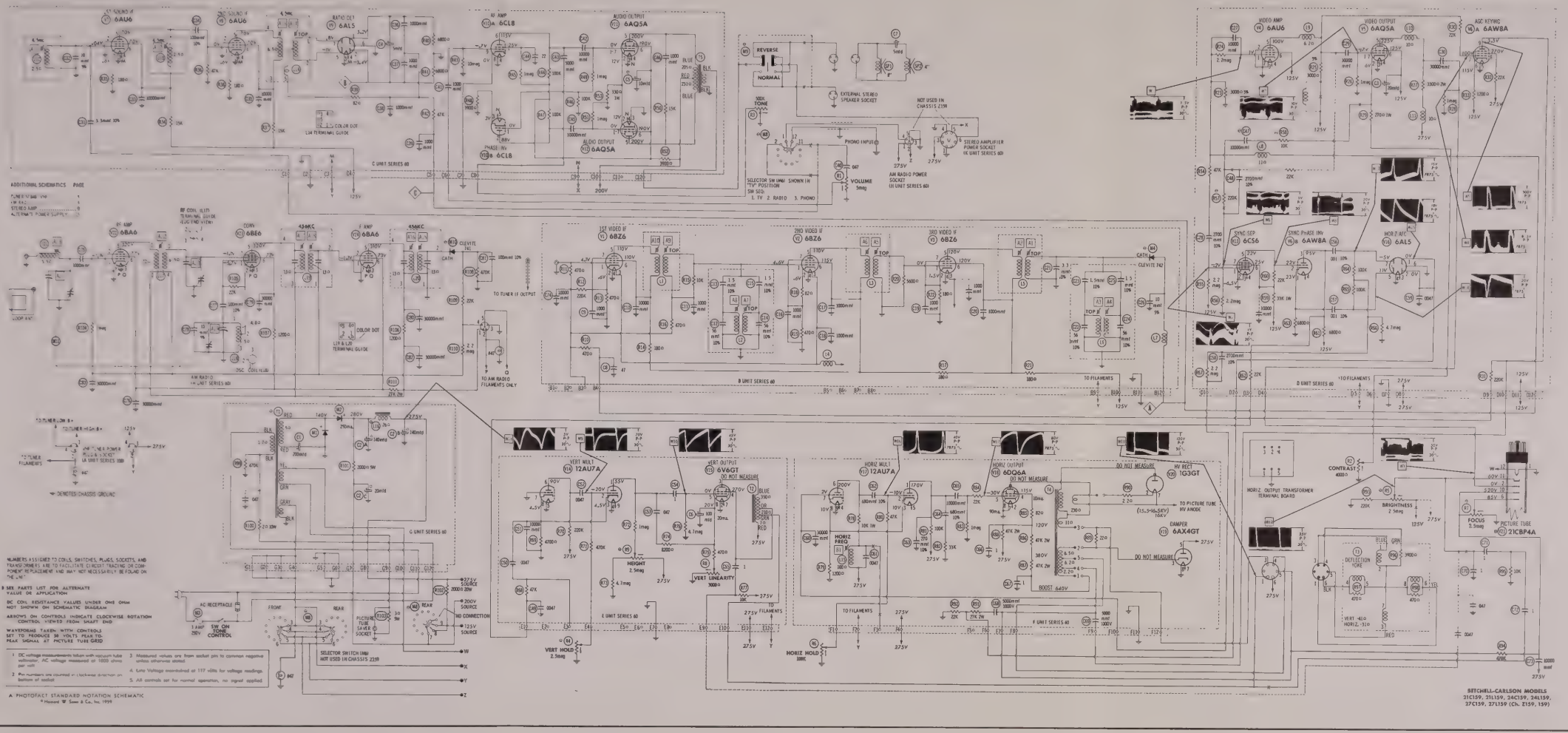
To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A14) located on top of chassis.

CENTERING

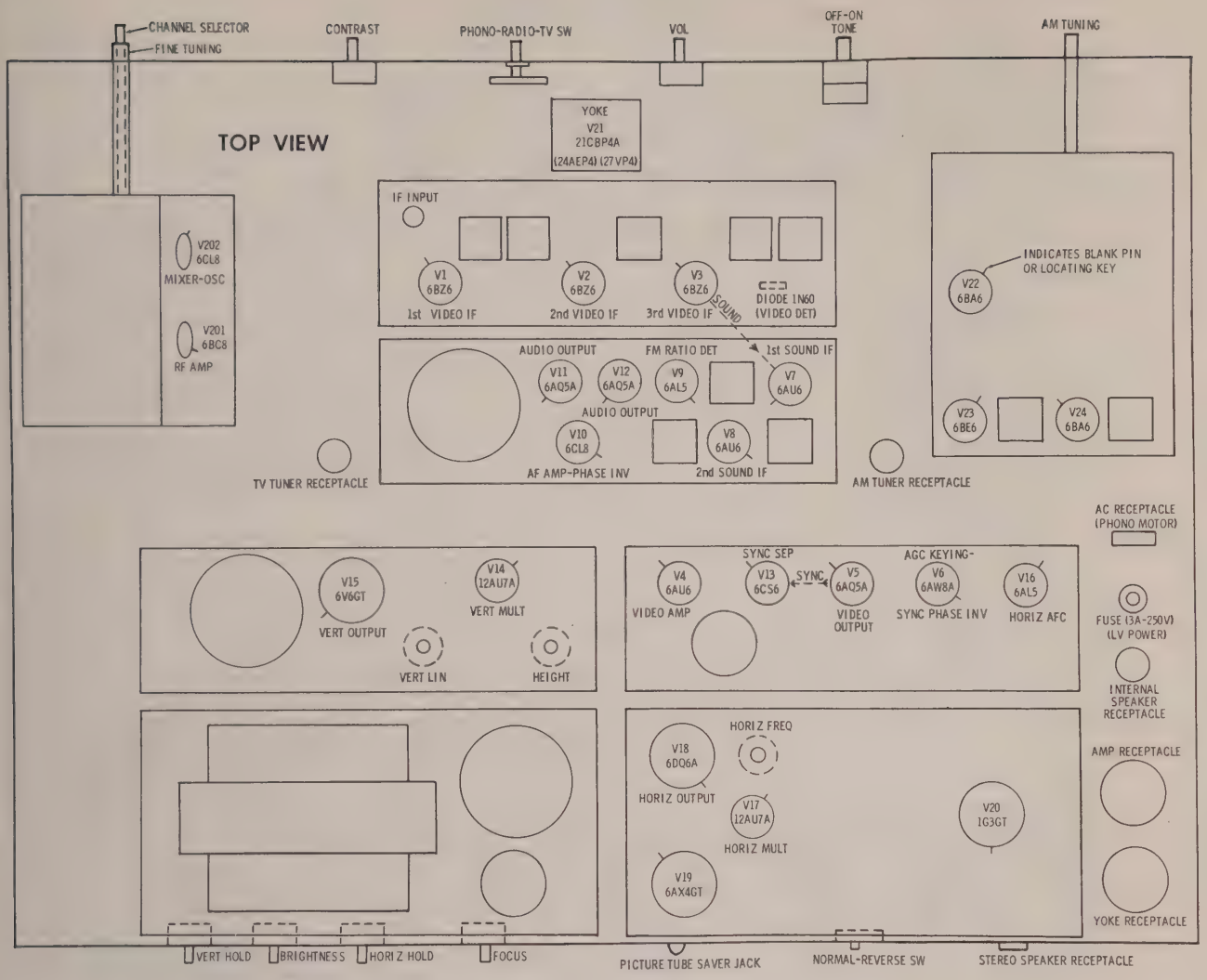
Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S.A. of America


1ST SOUND IF V7 6AU6
2ND SOUND IF V8 6AU6
RATIO DET V9 6AL5
AF AMP V12A 6CL8
AUDIO OUTPUT V13 6AQ5A
PHASE INV V12B 6CL8
AUDIO OUTPUT V10 6AQ5A
REVERSE
NORMAL
500K TONE
EXTERNAL STEREO SPEAKER SOCKET
NOT USED IN CHASSIS 2159
PHONO INPUT
VOLUME 5meg
AM RADIO POWER SOCKET (H UNIT SERIES 60)
STEREO AMPLIFIER POWER SOCKET (K UNIT SERIES 60)
SELECTOR SW (AM) SHOWN IN "TV" POSITION SW SEQ. 1. TV 2. RADIO 3. PHONO
C UNIT SERIES 60
RF AMP V1 6BA6
CONV V2 6BE6
43MKC
1 AMP V3 6BA6
45MKC
CLEVITE 741
TO TUNER IF OUTPUT
TO AM RADIO FILAMENTS ONLY
AM RADIO (H UNIT SERIES 60)
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6BZ6
TO FILAMENTS
B UNIT SERIES 60
VIDEO AMP V4 6AU6
VIDEO OUTPUT V1 6AQ5A
AGC KEYING V6A 6AW8A
SYNC SEP V5 6CS6
SYNC PHASE INV V6B 6AW8A
HOR F AFC V16 6AL5
110 FILAMENTS
D UNIT SERIES 60
VERT MULT V14 12AU7A
VERT OUTPUT V15 6V6GT
DO NOT MEASURE
HEIGHT 2.5meg
VERT LINEARITY 300Ω
VERT HOLD 2.5meg
E UNIT SERIES 60
HORIZ MULT V17 12AU7A
HORIZ OUTPUT V18 6DQ6A
HV RECT V20 1G3GT
TO PICTURE TUBE HV ANODE
(15.5-16.5KV) 1mA
DAMPER V19 6AX4GT
HORIZ FREQ
BOOST 640V
HORIZ HOLD 100K
F UNIT SERIES 60
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
CONTRAST 400Ω
BRIGHTNESS 2.5meg
FOCUS 2.5meg
PICTURE TUBE V21 21CBP4A
DEFLECTION YOKE
VERT -410 HORIZ -310
G UNIT SERIES 60
TO TUNER H.V. B+
TO TUNER POWER PLUG & SOCKET (A UNIT SERIES 100)
TO TUNER FILAMENTS
DENOTES CHASSIS GROUND
AC RECEPTACLE
1 AMP SLO-BLO
SW ON TONE CONTROL
FRONT
REAR
PICTURE TUBE SAVER SOCKET
SELECTOR SWITCH (AM) NOT USED IN CHASSIS 2159
200V SOURCE
125V SOURCE
NO CONNECTION
TO FILAMENTS
COLOR DOT L14 TERMINAL GUIDE
LF & L20 TERMINAL GUIDE
RF COIL (L17) TERMINAL GUIDE (ELECTRO VIEW)
ADDITIONAL SCHEMATICS PAGE
TUNER H.V. B+
TUNER IF
STEREO AMP
ALTERNATE POWER SUPPLY
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE CHASSIS
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER OHMS OHMS NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE GRID
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959
SITCHELL-CARLSON MODELS
21C159, 21L159, 24C159, 24L159,
27C159, 27L159 (Ch. Z159, 159)

# TUBE PLACEMENT CHART




SETCHELL-CARLSON MODELS
21C159, 21L159, 24C159, 24L159,
27C159, 27L159 (Ch. Z159, 159)

# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

**POWER SUPPLY FAILURE**
No raster, no sound Fuse (3A), Rect. (B+)

**SWEEP FAILURE**
No raster, has sound V16, V17, V18, V18, V20, V21, Rect. (B+)
No vertical deflection V14, V15
Poor vert. linearity or foldover V14, V15
Poor horiz. linearity or foldover V17, V18, V19
Narrow picture V17, V18, V19, Rect. (B+)
Vert. off freq. V14
Horiz. off freq. V17

**LOSS OF PICTURE OR SOUND**
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.)
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V21
Has pic, no sound V7, V8, V9, V10, V11, V12
Overloaded picture V6

**SYNC FAILURE**
No vert. sync V13, V6
No horiz. sync V13, V6, V16
No vert. or horiz. sync V13, V6

FOLDER 2

# ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: Coil Slugs .....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
Trimmers .....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

VIDEO IF ALIGNMENT

Remove Mixer-Osc. tube from its socket to disable the local oscillator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .001mfd | High side to pin 1 (grid) of 3rd Video IF (V3). Low side to chassis. | 44.0MC (10MC Swp) | 41.25MC 45.75MC 47.25MC | Any non-interfering channel | Vert. Amp. thru 10K to point (A). Low side to chassis. (Across Video Det. load) | A1, A2, A3, A4 | Adjust A1 and A2 for response curve similar to Fig. 1 with 45.75MC marker as shown. Adjust A3 to place 47.25MC marker in trap notch, A4 to place 41.25MC in other trap notch. |
| 2. | " | High side to pin 1 (grid) of 2nd Video IF (V2). Low side to chassis. | " | " | " | " | A5, A6 | Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. |
| 3. | " | High side to pin 1 (grid) of 1st Video IF (V1). Low side to chassis. | " | 41.25MC 45.75MC 47.25MC | " | " | A7, A8, A9, A10 | Adjust A7 and A8 for response similar to Fig. 2. Adjust A9 to place 41.25MC marker in trap notch. Adjust A10 to place 47.25MC marker in other trap notch. |
| 4. | Direct | Replace V202 in its socket. Place a thin insulated metal strip between the Mixer-Osc. (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis. | " | " | " | " | Mixer Plate Coil | Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. If necessary, retouch A1, A2, & A5 thru A8 for correct response. |

SOUND IF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 5. | .001mfd | High side to point (A). Low side to chassis. | 4.5MC (Unmod) | Any non-interfering channel | DC probe to point (B). Common to chassis. | A11, A12, A13 | Adjust for maximum deflection. |
| 6. | " | " | " | " | DC probe to point (C). Common to chassis. | A14 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

AM RADIO ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | .05mfd | High side to pin 7 (grid) of Converter. Low side to chassis. | 456KC (400% Mod) | AM | Tuning gang fully open | Across voice coil | A15, A16, A17, A18 | Adjust for maximum output. |
| 8. | | Loop | 1600KC | " | 1600KC | " | A19, A20, A21 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 9. | | " | 600KC | " | 600KC | " | A22, A23 | Adjust for maximum output. Repeat steps 8 and 9. |

FM RADIO ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | .001mfd | High side to pin 7 (grid) of Mixer. Low side to chassis. | 10.7MC (Unmod) | FM | Point of non-interference | DC probe to point (D). Common to chassis. | A24, A25, A26, A27 A28 | Adjust for maximum deflection. |
| 11. | " | " | " | " | " | DC probe to point (E). Common to chassis. | A29 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |
| 12. | 10mmf | High side to antenna terminal. Low side to chassis. | 108MC (Unmod) | " | " | DC probe to point (D). Common to chassis. | A30, A31 | Adjust for maximum deflection. |

ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

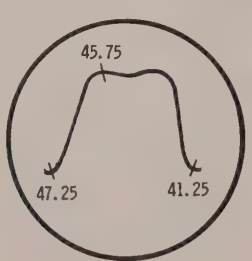


FIG. 1

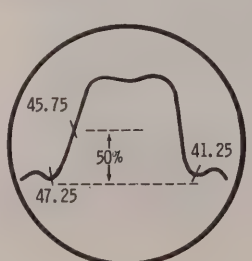
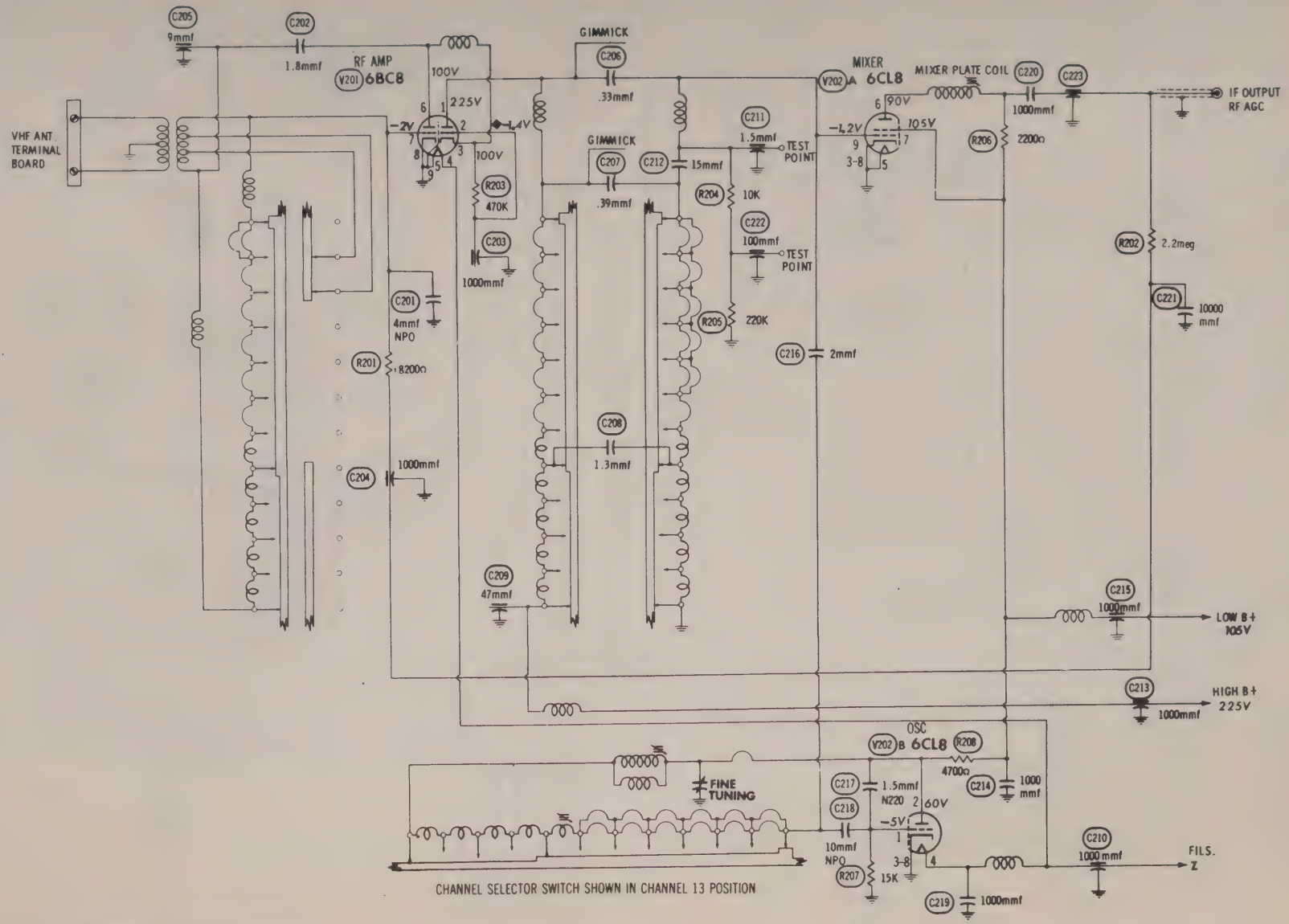


FIG. 2

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## VHF TUNER #57B48

SETCHELL-CARLSON MODELS 21C159, 21L159, 24C159, 24L159, 27C159, 27L159 (Ch. Z159, 159)

# TUNER PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V201 | RF Amplifier | 6BC8 | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V202 | Mixer-Osc. | 6CL8 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA Setchell-Carlson PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C201 | 4 | | | | | C10V4C | | | | NPO |
| C202 | 1.8 | | | | | | | | | |
| C203 | 1000 | | | EF-001 | MFT-1000 | | | | 503C-D1 | |
| C204 | 1000 | | | EF-001 | MFT-1000 | | | | 503C-D1 | |
| C205 | 9 | | | | | | | | | |
| C206 | .33 | | | | | | | | | |
| C207 | .39 | | | | | | | | | |
| C208 | 1.3 | | | | | | | | | |
| C209 | 47 | | | | | | | | | |
| C210 | 1000 | | | EF-001 | MFT-1000 | | | | 503C-D1 | |
| C211 | 1.5 | | | | | | | | | |
| C212 | 15 | | | BPD-000015 | DD-150 | L10Q15 | ED-15 | UC-5415 | 5GA-Q15 | |
| C213 | 1000 | | | EF-001 | MFT-1000 | | | | 503C-D1 | |
| C214 | 1000 | | | BPD-001 | DD-102 | BYA6D1 | ED-1000 | DC521 | 5HK-D1 | |
| C215 | 1000 | | | EF-001 | MFT-1000 | | | | 503C-D1 | |
| C216 | 2 | | | | | C10V2C | | | | |
| C217 | 1.5 | | | | | | | | | N220 |
| C218 | 10 | | | NPO-SI 10 | TCZ-10 | CTA6Q1C | TCO-10 | ZT-541 | 5TCC-Q1 | NPO |
| C219 | 1000 | | | BPD-001 | DD-102 | BYA6D1 | ED-1000 | DC521 | 5HK-D1 | |
| C220 | 1000 | | | BPD-001 | DD-102 | BYA6D1 | ED-1000 | DC521 | 5HK-D1 | |
| C221 | 10000 | | | BPD-01 | DD-103 | BYA6S1 | ED-01 | DC511 | 5HK-S1 | |
| C222 | 100 | | | EF-0001 | MFT-100 | | | | 503C-T1 | |
| C223 | | | | | | | | | | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| R201 | 8200Ω | | | |
| R202 | 4.7meg | | | |
| R203 | 470K | | | |
| R204 | 10K | | | |

| ITEM No. | RATING OHMS | RATING WATT | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| R205 | 220K | | | |
| R206 | 2200Ω | | | |
| R207 | 15K | | | |
| R208 | 4700Ω | | | |

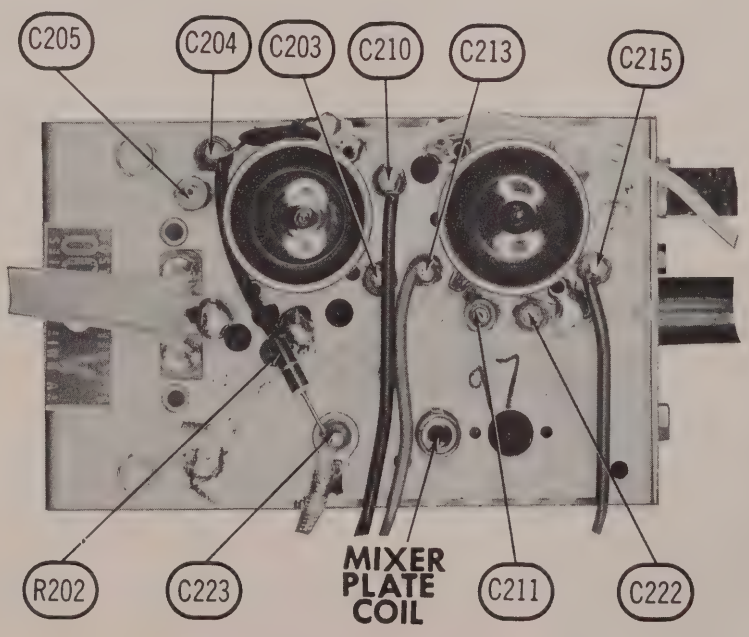
# TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT

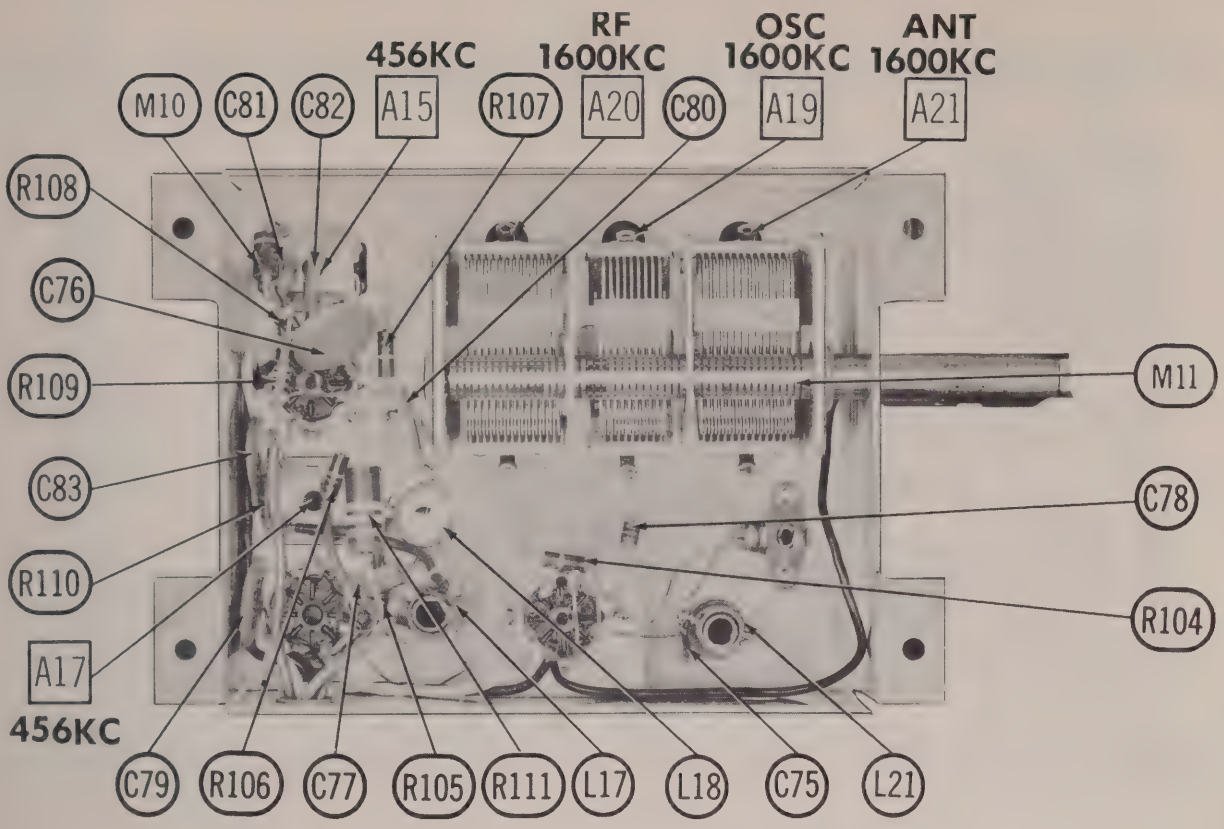
Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 1 o'clock, and should be adjusted first. The LOW band adjustment is located at 6 o'clock. Adjust for best picture and sound.

RF AND MIXER ALIGNMENT

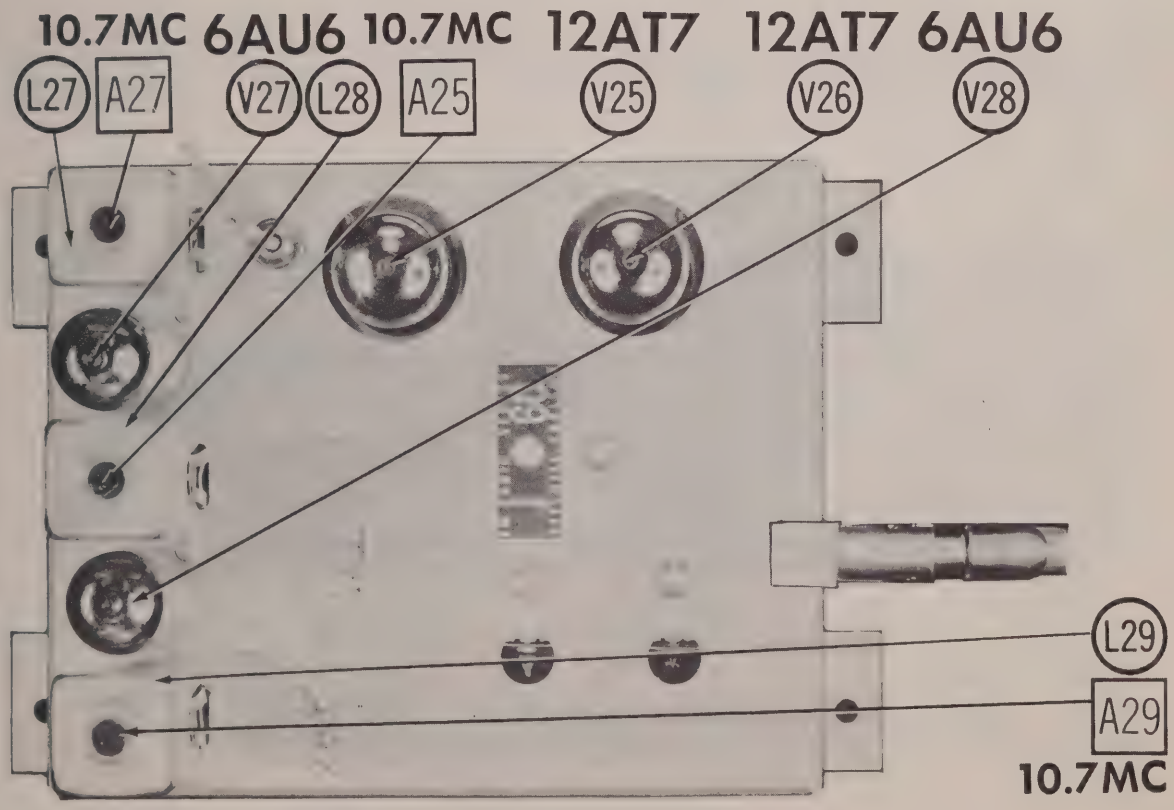
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



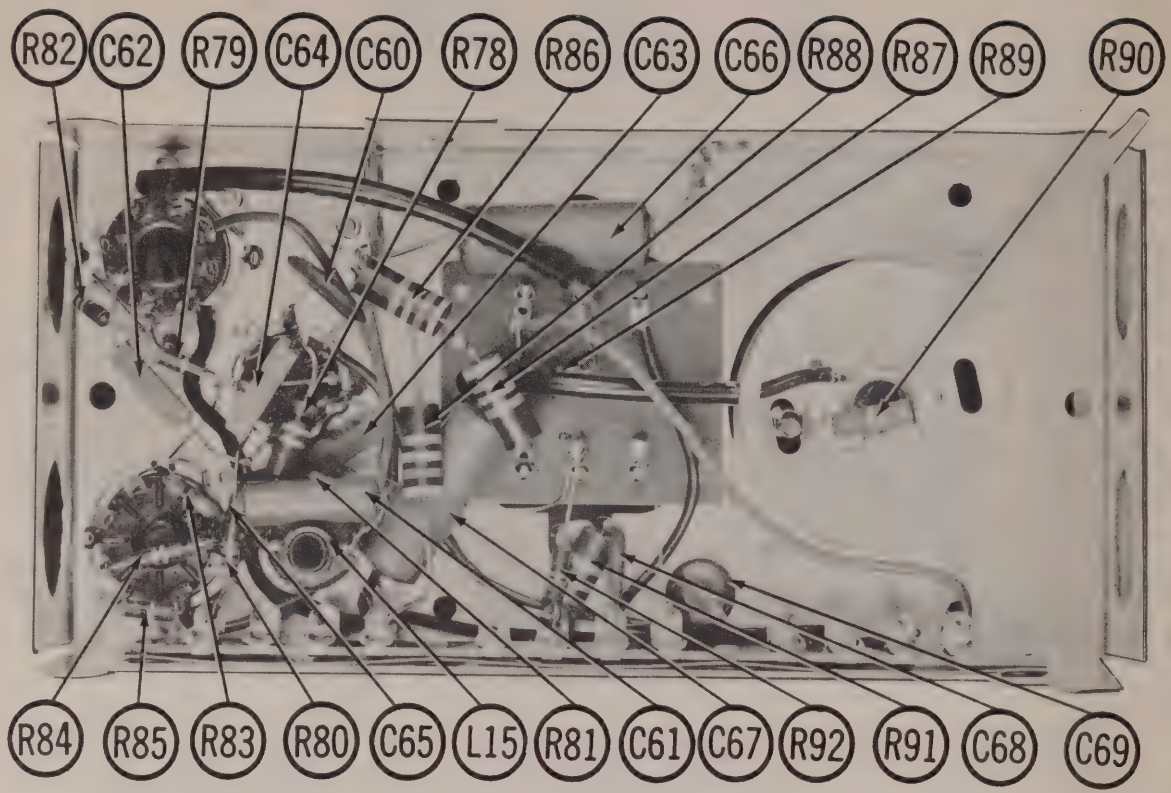

RF TUNER - TOP VIEW



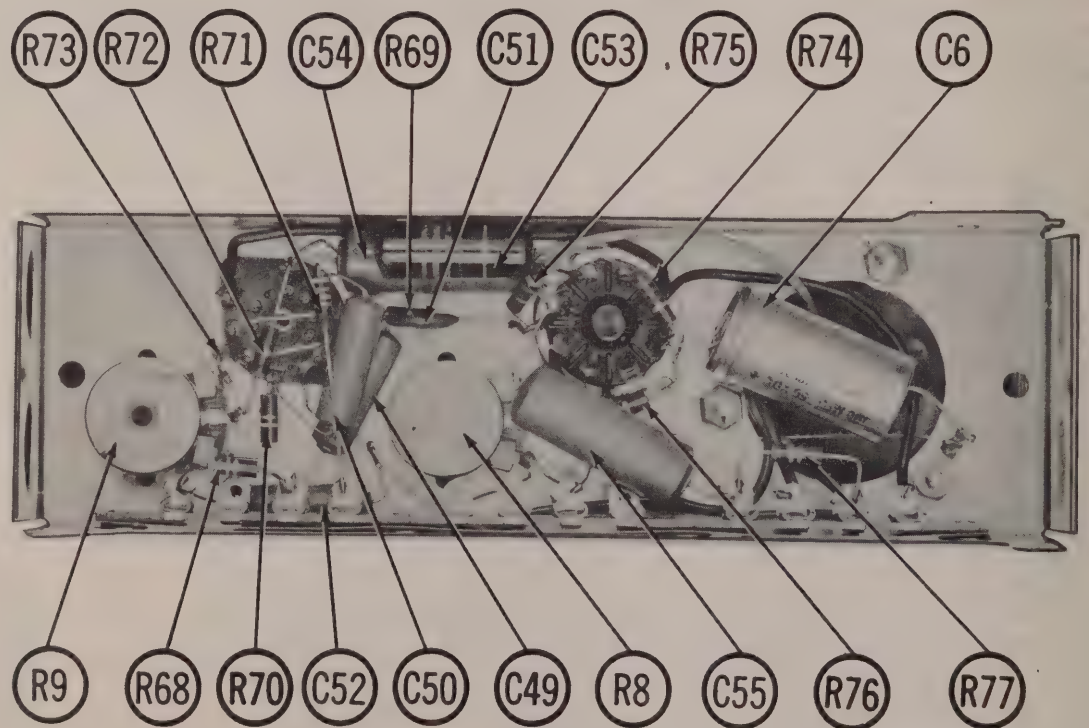

AM TUNER - BOTTOM VIEW



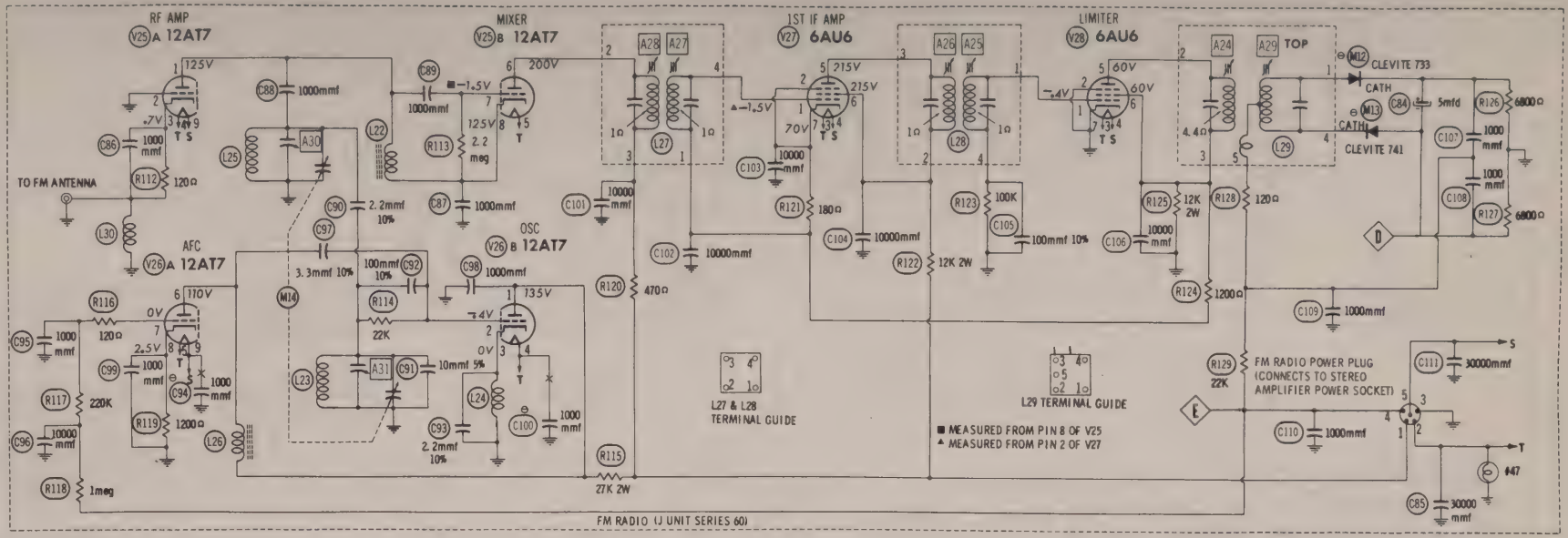

FM TUNER - TOP VIEW

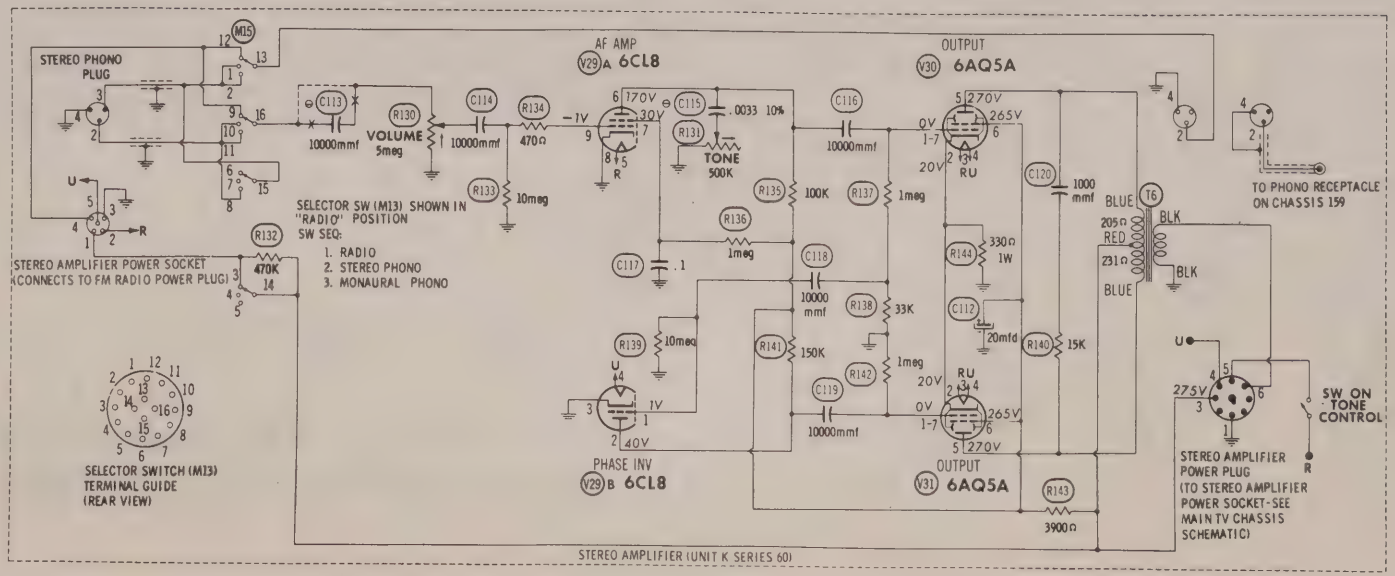



HORIZONTAL SUB-CHASSIS




VERTICAL SUB-CHASSIS

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# FM TUNER & STEREO AMP

## SETCHELL-CARLSON MODELS 21C159, 21L159, 24C159, 24L159, 27C159, 27L159 (Ch. Z159, 159)

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | 1st Video IF Amp. | 6BZ6 | |
| V2 | 2nd Video IF Amp. | 6BZ6 | |
| V3 | 3rd Video IF Amp. | 6BZ6 | |
| V4 | Video Amp. | 6AU6 | |
| V5 | Video Output | 6AQ5A | |
| V6 | AGC Keying-Sync Phase Inv. | 6AW8A | |
| V7 | 1st Sound IF Amp. | 6AU6 | |
| V8 | 2nd Sound IF Amp. | 6AU6 | |
| V9 | Ratio Det. | 6AL5 | |
| V10 | AF Amp. -Phase Inv. | 6CL8 | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V11 | Audio Output | 6AQ5A | |
| V12 | Audio Output | 6AQ5A | |
| V13 | Sync Sep. | 6CS6 | |
| V14 | Vert. Mult. | 12AU7A | |
| V15 | Vert. Output | 6V6GT | |
| V16 | Horiz. AFC | 6AL5 | |
| V17 | Horiz. Mult. | 12AU7A | |
| V18 | Horiz. Output | 6DQ6A | |
| V19 | Damper | 6AX4GT | |
| V20 | HV Rect. | 1G3GT | |

## PICTURE TUBE

| ITEM No. | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|
| | Setchell-Carlson PART No. | GENERAL ELECTRIC PART No. | RCA PART No. | SYLVANIA PART No. | |
| V21 | 21CBP4A<br>24AEP4<br>27VP4 | 21BTP4 ① | 21CBP4-A ②<br>24AEP4 ② | 21CBP4/<br>21CBP4A ③<br>24AEP4 ③ | ①"Aluminized" Add Ion Trap.<br>② "Silverama" ®<br>③ "Silver Screen 85" |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Setchell-Carlson PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1 | 200 | 200 | | PR1-075 | BR20015 | WS342 | TD-200-200 | TVA-1480 | |
| C2A | ▲140 | 350 | | AFH3-29-98 | D0046 | | | TVLS-3648 * | |
| B | ▲140 | 350 | | | BR10035 | | | | |
| C | ■20 | 350 | | | | | | | |
| C3 | 20 | 350 | | AFH1-45 | A0406 | FP144 | TMS-50 | TVL-1612 | |
| C4 | 5 | 150 | | SRE150V5 | BBR4-150 | TT150X5 | TD-4-150 | TVA-1403 | |
| C5 | 10 | 450 | ① | PRS450V10 | BR1045 | TC72 | TD-10-450 | TVA-1705 | |
| C6 | 100 | 50 | | PRS50V100 | BR1005 | TC3501 | TD-100-50 | TVA-1310 | |
| C7 | 5 | 150 | | SRE150V5 | BBR4-150 | TT150X5 | TD-4-150 | TVA-1403 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 20mfd in this application.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | Setchell-Carlson PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | | |
| C8 | .47 | 200 | | | P288N-47 | | CUB2P47 | GEM-2047 | 2TM-P47 | | |
| C9 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C10 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | | |
| C11 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C12 | 56 | | 10% | | 1469-000056 | TCZ-56 | 22R5Q56 | CNO-456 | MS-456 | | |
| C13 | 1.5 | | 10% | | NPO-SI 1.5 | TCZ-1R5 | C10V15C | ZT-5515 | 5TCCB-V15S 10%* | | |
| C14 | 56 | | 10% | | 1469-000056 | TCZ-56 | 22R5Q56 | CNO-456 | MS-456 | | |
| C15 | 1.5 | | 10% | | NPO-SI 1.5 | TCZ-1R5 | C10V15C | ZT-5515 | 5TCCB-V15S 10% * | | |
| C16 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C17 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C18 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C19 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C20 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C21 | 3.3 | | 10% | | NPO-SI 3.3 | TCZ-3R3 | C10V33C | ZT-5533 | 5TCCB-V33S10%* | | |
| C22 | 56 | | 10% | | 1469-000056 | TCZ-56 | 22R5Q56 | CNO-456 | MS-456 | | |
| C23 | 1.5 | | 10% | | NPO-SI 1.5 | TCZ-1R5 | C10V15C | ZT-5515 | 5TCCB-V15S10%* | | |
| C24 | 56 | | 10% | | 1469-000056 | TCZ-56 | 22R5Q56 | CNO-456 | MS-456 | | |
| C25 | 1.5 | | 10% | | NPO-SI 1.5 | TCZ-1R5 | C10V15C | ZT-5515 | 5TCCB-V15S10%* | | |
| C26 | 10 | | 5% | | NPO-SI 10 | TCZ-10 | C10Q1C | CNO-410 | MS-41 | | |
| C27 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | | |
| C28 | 2700 | | 10% | | DI-2700 | | PM6D3 | GEM-1623 | 10TM-D3 | | |
| C29 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-1013 | 5HK-S3 | | |
| C30 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-1013 | 5HK-S3 | | |
| C31 | 3.3 | | 10% | | NPO-SI 3.3 | TCZ-3R3 | C10V33C | ZT-5533 | 5TCCB-V33S 10%* | | |
| C32 | 10 | | 5% | | NPO-SI 10 | TCZ-10 | C10Q1C | CNO-410 | MS-41 | | |
| C33 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | | |
| C34 | 100 | | 10% | | 1469-0001 | DD-101 | 22R5T1 | MCB235 | MS-31 | | |
| C35 | 10000 | | | | BPD-01 | DD-103 | BYA10D1M | B-110 | 5HK-S1 | | |
| C36 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C37 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C38 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C39 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C40 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | | |
| C41 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C42 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | | |
| C43 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | | |
| C44 | .22 | 400 | | | P488N-22 | | CUB4P22 | GEM-4022 | 4TM-P22 | | |
| C45 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | | |
| C46 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | | |
| C47 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | | ① |
| C48 | 2700 | | 10% | | 1469-00027 | TCZ-270 | 22R5T27 | | MS-327 | | |
| C49 | .0047 | 400 | | | P488N-0047 | D6-472 | CUB6D47 | GEM-6247 | 6TM-D47 | | |
| C50 | .0047 | 400 | | | P488N-0047 | D6-472 | CUB6D47 | GEM-6247 | 6TM-D47 | | |
| C51 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | | |
| C52 | .0047 | 400 | | | P488N-0047 | D6-472 | CUB6D47 | GEM-6247 | 6TM-D47 | | |
| C53 | .047 | 400 | | | P488N-047 | D6-472 | CUB4S47 | GEM-4147 | 4TM-S47 | | |
| C54 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | | |
| C55 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | | |
| C56 | .001 | 600 | 10% | | V84C6D1 | | PM6D1 | GTM-621 | 6TM-D1 | | |
| C57 | .001 | 600 | 10% | | V84C6D1 | | PM6D1 | GTM-621 | 6TM-D1 | | |
| C58 | 2700 | | 10% | | DI 2700 | | PM6D3 | GEM-1623 | 10TM-D27 | | |

# PARTS LIST AND DESCRIPTIONS (cont)

## CAPACITORS (cont)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | Setchell-Carlson PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C59 | .0047 | 400 | | | P488N-0047 | D6-472 | CUB4D47 | GEM-6247 | 6TM-D47 | |
| C60 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-1013 | 5HK-S3 | |
| C61 | .0047 | 400 | | | P488N-0047 | D6-472 | CUB4D47 | GEM-6247 | 6TM-D47 | |
| C62 | 680 | | 10% | | 1464-00068 | D6-681 | 1R5T68 | JL-368 | MS-368 | |
| C63 | 270 | | 10% | | 1469-00027 | D6-271 | 22R5T27 | JL-327 | MS-327 | |
| C64 | 680 | | 10% | | 1464-00068 | D6-681 | 1R5T68 | JL-368 | MS-368 | |
| C65 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C66 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C67 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C68 | 5000 | 1000 | | | DAC-9 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C69 | 5000 | 1000 | | | DAC-9 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C70 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C71 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C72 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C73 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C74 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |

① Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Setchell-Carlson PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 5meg | ½ | 817 | B-88 | A47-5meg-Z | Q13-141 | U65 | Volume |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R2A | 4000Ω | ½ | 805 | AB-12 | A47-4000-S | Q17-114 | | Contrast |
| B | Shaft | | | AK-3 | FS-3 | Not Req. | | |
| R3A | 500K | ½ | 816 | B-60 | A47-500K-Z | Q13-133 | U48 | Tone |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | Off-On |
| R4A | 2.5meg | ½ | 803 | BX-83 | A47-2.5meg-S | B11-239 | U255 | Vert. Hold, Note 1 |
| B | Shaft | | | Not Req. | FKS-1/4 | SK-3 | Not Req. | |
| R5A | 2.5meg | ½ | 803 | BX-83 | A47-2.5meg-S | B11-239 | U255 | Brightness, Note 1 |
| B | Shaft | | | Not Req. | FKS-1/4 | SK-3 | Not Req. | |
| R6A | 100K | ½ | 802 | BX-40 | A47-100K-S | Q11-128 | U41 | Horiz. Hold |
| B | Shaft | | | Not Req. | FKS-1/4 | SQ | Not Req. | |
| R7A | 2.5meg | ½ | 803 | BX-83 | A47-2.5meg-S | B11-239 | U255 | Focus, Note 1 |
| B | Shaft | | | Not Req. | FKS-1/4 | SK-3 | Not Req. | |
| R8A | 3000Ω | ½ | 801 | AB-8 | A47-3000-S | B11-112 | U8 | Vert. Lin. |
| B | Shaft | | | AK-1 | FKS-1/4 | SK-3 | Not Req. | |
| R9A | 2.5meg | ½ | 803 | BX-83 | A47-2.5meg-S | B11-239 | U255 | Height, Note 1 |
| B | Shaft | | | Not Req. | FKS-1/4 | SK-3 | Not Req. | |

Note 1. Some versions may use 2meg in this application (Part #803).

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R10 | 470Ω | | | |
| R11 | 470Ω | | | |
| R12 | 220K | | | |
| R13 | 470Ω | | | |
| R14 | 180Ω | | | |
| R15 | 10K | | | |
| R16 | 470Ω | | | |
| R17 | 180Ω | | | |
| R18 | 82Ω | | | |
| R19 | 470Ω | | | |
| R20 | 5600Ω | | | |
| R21 | 180Ω | | | |
| R22 | 180Ω | | | |
| R23 | 3000Ω 5% | | | |
| R24 | 2.2meg | | | |
| R25 | 3000Ω 5% | | | |
| R26 | 1meg | | | |
| R27 | 3300Ω | 2 | | |
| R28 | 1meg | | | |
| R29 | 270Ω | 1 | | |
| R30 | 22K | | | |
| R31 | 220K | | | |
| R32 | 22K | | | |
| R33 | 1200Ω | | | |
| R34 | 15K | | | |
| R35 | 180Ω | | | |
| R36 | 47K | | | |
| R37 | 15K | | | |
| R38 | 180Ω | | | |
| R39 | 82Ω | | | |
| R40 | 6800Ω | | | |
| R41 | 6800Ω | | | |
| R42 | 47K | | | |
| R43 | 10meg | | | |
| R44 | 100K | | | |
| R45 | 1meg | | | |
| R46 | 100K | | | |
| R47 | 100K | | | |
| R48 | 3900Ω | | | |
| R49 | 1meg | | | |
| R50 | 15K | | | |
| R51 | 1meg | | | |
| R52 | 3900Ω | | | |
| R53 | 330Ω | 1 | | |
| R54 | 47K | | | |
| R55 | 2.2meg | | | |
| R56 | 2.2meg | | | |

| ITEM No. | RATING | | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R57 | 220K | | | Note 1 |
| R58 | 10K | | | Note 1 |
| R59 | 33K | 1 | | |
| R60 | 22K | | | |
| R61 | 6800Ω | | | |
| R62 | 22K | | | |
| R63 | 6800Ω | | | |
| R64 | 100K | | | |
| R65 | 100K | | | |
| R66 | 4.7meg | | | |
| R67 | 2.2meg | | | |
| R68 | 47K | | | |
| R69 | 4700Ω | | | |
| R70 | 220K | | | |
| R71 | 470K | | | |
| R72 | 1meg | | | |
| R73 | 4.7meg | | | |
| R74 | 8200Ω | | | |
| R75 | 470Ω | | | |
| R76 | 4.7meg | | | |
| R77 | 10K | | | |
| R78 | 10K | 1 | | |
| R79 | 1200Ω | | | |
| R80 | 47K | | | |
| R81 | 100K | | | |
| R82 | 33K | | | |
| R83 | 1meg | | | |
| R84 | 22K | | | |
| R85 | 82Ω | | | |
| R86 | 47K | 2 | | |
| R87 | 47K | 2 | | |
| R88 | 47K | 2 | | |
| R89 | 22Ω | | | |
| R90 | 2.2Ω | | | |
| R91 | 27K | 2 | | |
| R92 | 22K | | | |
| R93 | 220K | | | |
| R94 | 470K | | | |
| R95 | 10K | | | |
| R96 | 3900Ω | | | |
| R97 | 470Ω | | | |
| R98 | 470Ω | | | |
| R99 | 470K | | | |
| R100 | 2Ω | 10 | | |
| R101 | 2000Ω | 5 | | |
| R102 | 2000Ω | 20 | | |
| R103 | 3Ω | 5 | | |

Note 1. Not used in some versions.

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No | USE | REPLACEMENT DATA: Setchell-Carlson PART No | Meissner PART No | Merit PART No | Miller PART No | Ram PART No | NOTES |
|---|---|---|---|---|---|---|---|
| L1 | 1st Video IF | | | | | | |
| L1A | 47 25MC Trap | | | | | | |
| B | 41 25MC Trap | | | | | | |
| L3 | 2nd Video IF | | | | | | |
| L4 | Fil. Choke | | 19-1001 | RC-562 | 4604 | | 1.4 Microhenries |
| L5 | 3rd Video IF | | | | | | |
| L5A | 47 25MC Trap | | | | | | |
| B | 41 25MC Trap | | | - | | | |
| L7 | RF Choke | | | | | | |
| L8 | Series Peaking Coil | | 19-1032 | TV-135 | 4648 | VP-8 | 235 Microhenries |
| L9 | Series Peaking Coil | | 19-1250 | TV-185 | 6181 | VP-6 | 235 Microhenries |
| L10 | Series Peaking Coil | | 19-1250 | TV-185 | 6181 | VP-6 | 235 Microhenries |
| L11 | Shunt Peaking Coil | | 19-1125 | TV-195 | 6153 | VP-4 | 138 Microhenries |
| L12 | 1st Sound IF | | | | | | |
| L13 | 2nd Sound IF | | | | | | |
| L14 | Ratio Detector | | 17-1497 | TV-115 | 6306 | SD-4 | |

## TRANSFORMER (HORIZ. OSC.)

| ITEM No | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: Setchell-Carlson PART No | Hallicrafters PART No | Merit PART No | Miller PART No | Ram PART No | Thordarson PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| L15 | .900Ω | | | | TV-163 | 5210 * | H-102 | HS-5 | Horiz. Freq. |

* Replace CW (.0047mfd) with .0033mfd.

## FILTER CHOKE

| ITEM No | RATINGS: CURRENT (Measured) | DC RES. | INDUCTANCE @ CURRENT 1000 Cps | REPLACEMENT DATA: Setchell-Carlson PART No | Hallicrafters PART No | Merit PART No | Ram PART No | Stancor PART No | Thordarson PART No | Triad PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L16 | 250A | 26Ω | 1.1 Hy. | LM1084 ① | | | | | | C-34X ② | |

① Not used in Ch. 2159. ② Drill new mounting holes.

## TRANSFORMER (POWER)

| ITEM No | RATING: PRI. | SEC. 1 | SEC. 2 | REPLACEMENT DATA: Setchell-Carlson PART No | Hallicrafters PART No | Merit PART No | Ram PART No | Stancor PART No | Thordarson PART No | Triad PART No |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V & 1.52A | 125V & 950A | 2V & 7A | TM1083 ① | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V & 9.7A | | | | | | | | | |
| | PRI | SEC. 1 | SEC. 2 | | | | | | | |
| | 117V & 1.2A | 115V & 20A | 7.6V & 8A tap & 6.3V & 7.5A | TM1018A ② | | | | | | |

① Chassis 1259. ② Chassis 1259.

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No | USE | REPLACEMENT DATA: Setchell-Carlson PART No | Hallicrafters PART No | Merit PART No | Ram PART No | Rogers PART No | Stancor PART No | Thordarson PART No | Triad PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T3 | Vert. Output Yoke-Horiz (20MH) (80°)-Vert. (38MH) | | Y-16 ①②③ | MDF-92 ②③④ | Y90F19/43 ①②③ | PCM2045 ①②③⑤ | DY-16A ①②③④ | Y-16 ①②③ | Y-41 & NW30 & YC-4 & CL-4 ① | |
| T4 | Horiz. Output | | | | | | | | | |

① Mount with leads out top. Connect 39000 ½ watt 10% resistor in series with lead to yoke terminals #3 and #7, connect yoke terminal #1 to yoke plug pin #3, yoke terminal #3 to yoke plug pin #6, 39000 resistor to yoke plug pin #4
② Use original yoke damping network, if necessary.
③ Requires new rear cover, centering device, and yoke clamp.
④ Remove damping network from yoke terminals #3 and #7.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No | IMPEDANCE PRI. | SEC. | REPLACEMENT DATA: Setchell-Carlson PART No | Hallicrafters PART No | Merit PART No | Ram PART No | Stancor PART No | Thordarson PART No | Triad PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T5 | 7200Ω CT | 3-4Ω | TM1085 | 25847 ① | A-2000 ① | AU-806 ① | A-3850 ① | 23847 ① | S-53X ① | ① Drill new mounting holes. |

## SPEAKER

| ITEM No | TYPE: SIZE | FIELD | V C | IMP | REPLACEMENT DATA: Setchell-Carlson PART No | QUAM PART No | NOTES |
|---|---|---|---|---|---|---|---|
| SP1 | 8 | PM | | 3-4Ω | | 8A31 | |
| SP2 | 4 | PM | | 3-4Ω | | 4A1 | |

## RECTIFIERS

| ITEM No | RATING: CURRENT (Measured) | REPLACEMENT DATA: Setchell-Carlson PART No | FEDERAL PART No | GENERAL ELECTRIC PART No | INTERNATIONAL PART No | SARKES TARZIAN PART No | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .250A | | 1A504 ① 1A504 ① | | SD-500 ① SD-500 ① | 40K ① 40K ① | ① Silicon Type. |
| M2 | .250A | | | | | | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA: Setchell-Carlson PART No. FUSE | HOLDER | LITTELFUSE PART No. FUSE | HOLDER | BUSS PART No FUSE | HOLDER |
|---|---|---|---|---|---|---|---|---|
| M3 | 3AG | 3A 250V | | | 312003 (3AG-3A - 250V | 342012 | AGC 3 | HKP-CC |

## CRYSTAL DIODES

| ITEM No. | OBSG. TYPE | REPLACEMENT DATA: Setchell-Carlson PART No. | CBS PART No. | SYLVANIA PART No | NOTES |
|---|---|---|---|---|---|
| M4 | Clevite 742 * | | 1N90 | 1N295 | Video Det. (Pigtail) |

* Some versions may use 1N80 in this application.

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA: Setchell-Carlson PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | JENSEN PART No CARTRIDGE | JENSEN PART No NEEDLE | REMARKS |
|---|---|---|---|---|---|---|
| M5 | | 13 TB | 13 T | | | |

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA: Setchell-Carlson PART No. | JENSEN PART No. | WALCO PART No. | REMARKS |
|---|---|---|---|---|
| M6 | | TS2S TS2SX *2S2D *2S2XD | | † Jewel ◊ Diamond |

## MISCELLANEOUS

| ITEM No. | PART NAME | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|
| M7 | Tuner | ST248 | VHF |
| M8 | Switch | | Function (TV-Radio-Phono) (Rotary, wafer) Not used in Ch. 2158 |
| M9 | Switch | | Sound Output, (Normal-Reverse)(Slide Type SPDT) Not used in Ch. 2195 |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

## WIRING DATA

| | |
|---|---|
| High Voltage Lead | Use BELDEN No. [redacted] |
| Shielded Hook-up Wire | Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor) |
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors |
| Power Cord (Interlock Type) | Use BELDEN No. 8874 |
| 300Ω Tuner Input Lead | Use BELDEN No. 8225 |
| 300Ω Antenna Lead-in | Use BELDEN No. 8230 or 8275 |
| Antenna Rotor Cable | Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor |

# AM RADIO

## TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No | USE | TYPE | NOTES |
|---|---|---|---|
| V22 | RF Amp | 6BA6 | |
| V23 | Converter | 6BE6 | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V24 | IF Amp | 6BA6 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No | RATING: CAP | VOLT | TOL | REPLACEMENT DATA: Setchell-Carlson PART No | AEROVOX PART No. | CENTRALAB PART No | CORNELL-DUBILIER PART No. | MALLORY PART No | SPRAGUE PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C75 | 1000 | | | | BPD-001 | DD-102 | BYA10DM | B-210 | 5HK-D1 | |
| C76 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | | 5HK-S3 | |
| C77 | 100 | | 10% | | 1469-0001 | UBET1 | MCB225 | | M5-31 | |
| C78 | 10 | | 5% | | 1469-00001 | TCZ-10 | C10QJC | CND-410 | M5-41 | |
| C79 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | | 5HK-S3 | |
| C80 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-613 | 5HK-S3 | |
| C81 | 100 | | 10% | | 1469-0001 | TCZ-100 | UBT1 | MCB225 | M5-31 | |
| C82 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-613 | 5HK-S3 | |
| C83 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-613 | 5HK-S3 | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No | RATING: OHMS | WATT | Setchell-Carlson PART No | NOTES |
|---|---|---|---|---|
| R104 | 1meg | | | |
| R105 | 22K | | | |
| R106 | 12000 | | | |
| R107 | 12000 | | | |

| ITEM No | RATING: OHMS | WATT | Setchell-Carlson PART No | NOTES |
|---|---|---|---|---|
| R108 | 470K | | | |
| R109 | 22K | | | |
| R110 | 2 Meg | | | |
| R111 | 27K | 2 | | |

## COILS (RF-IF)

| ITEM No | USE | REPLACEMENT DATA: Setchell-Carlson PART No | Meissner PART No | Merit PART No | Miller PART No | Ram PART No | NOTES |
|---|---|---|---|---|---|---|---|
| L17 | AM RF Coil | | | | | | Tapped @ .5Ω |
| L18 | AM Osc. Coil | | | | | | |
| L19 | AM Input IF | | 16-5758 | BC-352 | 12-C3 | VP-1 | |
| L20 | AM Output IF | | 16-5758 | BC-353 | 12-C3 | VP-2 | |
| L21 | AM Ant. Coil | | | | | | |

## CRYSTAL DIODES

| ITEM No | OBSG. TYPE | REPLACEMENT DATA: Setchell-Carlson PART No. | CBS PART No. | SYLVANIA PART No | NOTES |
|---|---|---|---|---|---|
| M10 | Clevite 741 * | | 1N80 | 1N396 | AM Det. (Pigtail) |

* Some versions may use 1N80 in this application.

## MISCELLANEOUS

| ITEM No | PART NAME | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|
| M11 | Tuning Cap | | AM 3 Section (Ant. 39-485mmf, RF 39-485mmf, Osc 22-185mmf) |

# FM RADIO

## TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No | USE | TYPE | NOTES |
|---|---|---|---|
| V25 | RF Amp -Mixer | 12AT7 | |
| V26 | Osc.-AFC | 12AT7 | |

| ITEM No | USE | TYPE | NOTES |
|---|---|---|---|
| V27 | 1st IF Amp | 6AU6 | |
| V28 | Limiter | 6AU6 | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING: CAP. | VOLT. | REPLACEMENT DATA: Setchell-Carlson PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C84 | 5 | 150 | | SRE150Y5 | BBR4-150 | TT150X5 | TD-4-150 | TVA-1403 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING: CAP. | VOLT | TOL | REPLACEMENT DATA: Setchell-Carlson PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No | SPRAGUE PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C85 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-613 | 5HK-S3 | |
| C86 | 2000 | | | | BPD-001 | DD-102 | BYA10DM | B-210 | 5HK-D1 | |
| C87 | 1000 | | | | BPD-001 | DD-102 | BYA10DM | B-210 | 5HK-D1 | |
| C88 | 1000 | | | | BPD-001 | DD-102 | BYA10DM | B-210 | 5HK-D1 | |
| C89 | 1000 | | | | BPD-001 | DD-102 | BYA10DM | B-210 | 5HK-D1 | |

SETCHELL-CARLSON MODELS 21C139, 21I139, 24C139, 24I139, 27C139, 27I139 (Ch. 2139, 159)

FOLDER 2

# PARTS LIST AND DESCRIPTIONS (cont)

## FM RADIO

### CAPACITORS (cont)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | Setchell-Carlson PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C90 | 2.2 | | 10% | | NPO-SI 2.2 | TCZ-2R2 | C10V22C | CNO-522 | 5TCCB-V22S 10%* | |
| C91 | 10 | | 5% | | NPO-SI 10 | TCZ-10 | C10Q1C | CNO-410 | MS-41 | |
| C92 | 100 | | 10% | | 1469-0001 | TCZ-100 | 1R5T1 | MCB235 | MS-31 | |
| C93 | 2.2 | | 10% | | NPO-SI 2.2 | TCZ-2R2 | C10V22C | CNO-522 | 5TCCB-V22S10%* | |
| C94 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | ① |
| C95 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C96 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C97 | 3.3 | | 10% | | NPO-SI 3.3 | TCZ-3R3 | C10V22C | ZT-5533 | 5TCCB-V33S10%* | |
| C98 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C99 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C100 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | ① |
| C101 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C102 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C103 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C104 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C105 | 100 | | 10% | | 1469-0001 | TCZ-100 | 1R5T1 | MCB235 | MS-31 | |
| C106 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C107 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C108 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C109 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C110 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C111 | 30000 | | | | BPD-03 | DF-303 | BYB6S3 | GEM-613 | 5HK-S3 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Not used in some versions.

### RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R112 | 120Ω | | | |
| R113 | 2.2meg | | | |
| R114 | 22K | | | |
| R115 | 27K | 2 | | |
| R116 | 120Ω | | | |
| R117 | 220K | | | |
| R118 | 1meg | | | |
| R119 | 1200Ω | | | |
| R120 | 470Ω | | | |

| ITEM No. | RATING | | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R121 | 180Ω | | | |
| R122 | 12K | 2 | | |
| R123 | 100K | | | |
| R124 | 1200Ω | | | |
| R125 | 12K | 2 | | |
| R126 | 6800Ω | | | |
| R127 | 6800Ω | | | |
| R128 | 120Ω | | | |
| R129 | 22K | | | |

### COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | Setchell-Carlson PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L22 | RF Choke | | | | | | 12.5 Microhenries |
| L23 | FM RF Coil | | | | | | |
| L24 | Cathode Choke | | | | | | 3.1 Microhenries |
| L25 | FM Osc. Coil | | | | | | |
| L26 | RF Choke | | | | | | 12.5 Microhenries |
| L27 | 1st FM IF | | 16-3487 | FM-254 | 1463 | | |
| L28 | 2nd FM IF | | 16-3487 | FM-254 | 1463 | | |
| L29 | Ratio Detector | | | | | | |
| L30 | FM Ant. Coil | | | | | | |

### CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|
| | | Setchell-Carlson PART No. | CBS PART No. | SYLVANIA PART No. | |
| M12 | Clevite 733 * | | 1N60 | 1N295 | Ratio Det. (Pigtail) |
| M13 | Clevite 741 * | | 1N60 | 1N295 | Ratio Det. (Pigtail) |

* Some versions may use 1N60 in this application.

### MISCELLANEOUS

| ITEM No. | PART NAME | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|
| M14 | Tuning Cap. | | FM 2 Section |
| M15 | Switch | | Selector (Rotary wafer) (Radio-Stereo phono-Mono phono) |

## AMP

### TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V29 | AF Amp.-Phase Inv. | 6CL8 | |
| V30 | Output | 6AQ5A | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V31 | Output | 6AQ5A | |

### ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Setchell-Carlson PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C112 | 20 | 350 | | HFH1-45 | A0406 | FP144 | TMS-50 | TVL-1612 | |

# PARTS LIST AND DESCRIPTIONS (cont)

## AMP

### FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | Setchell-Carlson PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C113 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | ① |
| C114 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C115 | .0033 | 400 | 10% | | V84C4D33 | | PM4D33 | GTM-4233 | 6TM-D33 | ② |
| C116 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C117 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C118 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C119 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C120 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |

① Not used in some versions.
② Some versions may use .0047mfd in this application.

### CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Setchell-Carlson PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R130A | 5meg | ½ | 817 | B-88 | A47-5meg-Z | Q13-141 | U65 | Volume |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R131A | 500K | ½ | 816 | B-60 | A47-500K-Z | Q13-133 | U48 | Tone |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | Off-On |

### RESISTORS

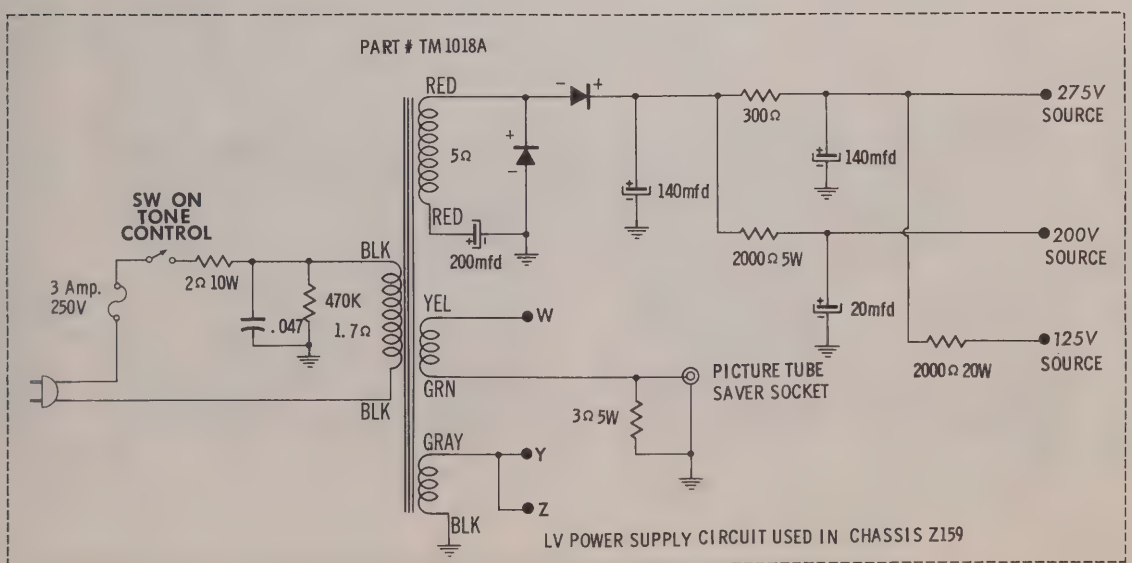
All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R132 | 470K | | | |
| R133 | 10meg | | | |
| R134 | 470Ω | | | |
| R135 | 100K | | | |
| R136 | 1meg | | | |
| R137 | 1meg | | | |
| R138 | 33K | | | |

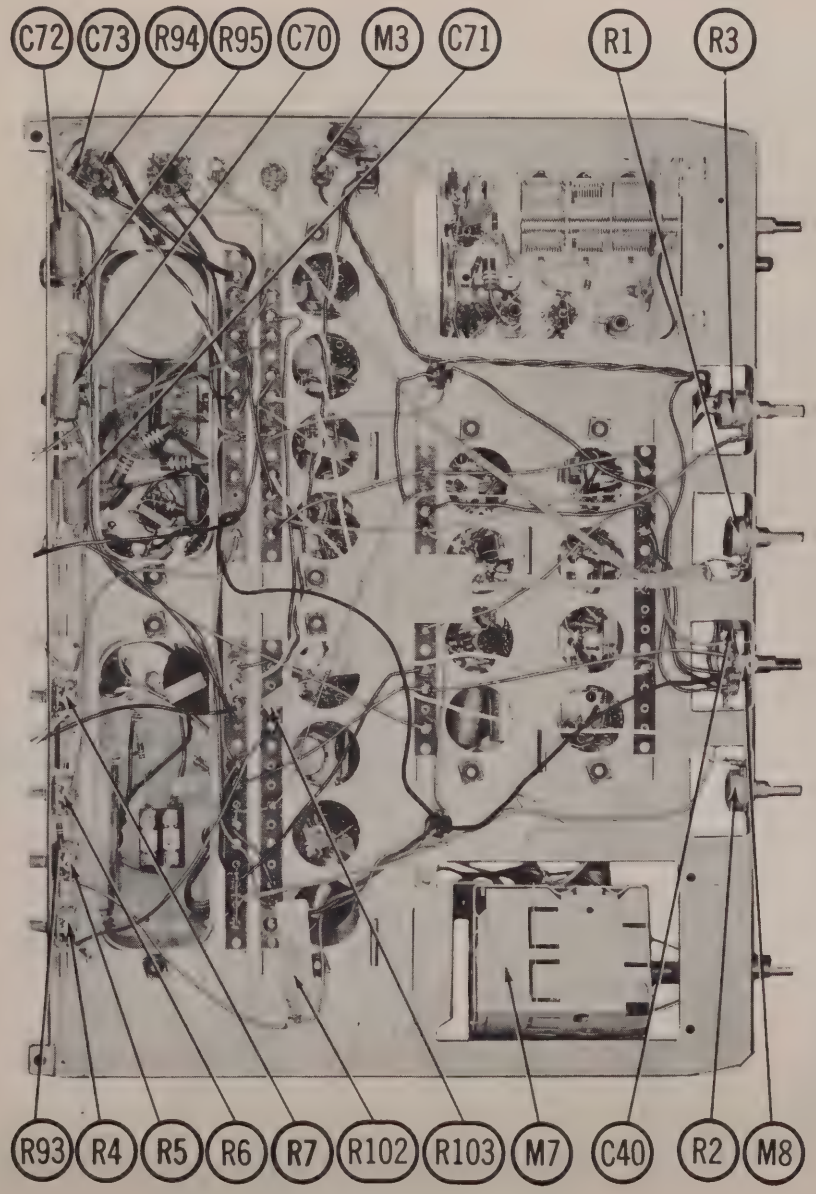
| ITEM No. | RATING | | Setchell-Carlson PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R139 | 10meg | | | |
| R140 | 15K | | | |
| R141 | 150K | | | |
| R142 | 1meg | | | |
| R143 | 3900Ω | | | |
| R144 | 330Ω | 1 | | |

### TRANSFORMER (AUDIO OUTPUT)

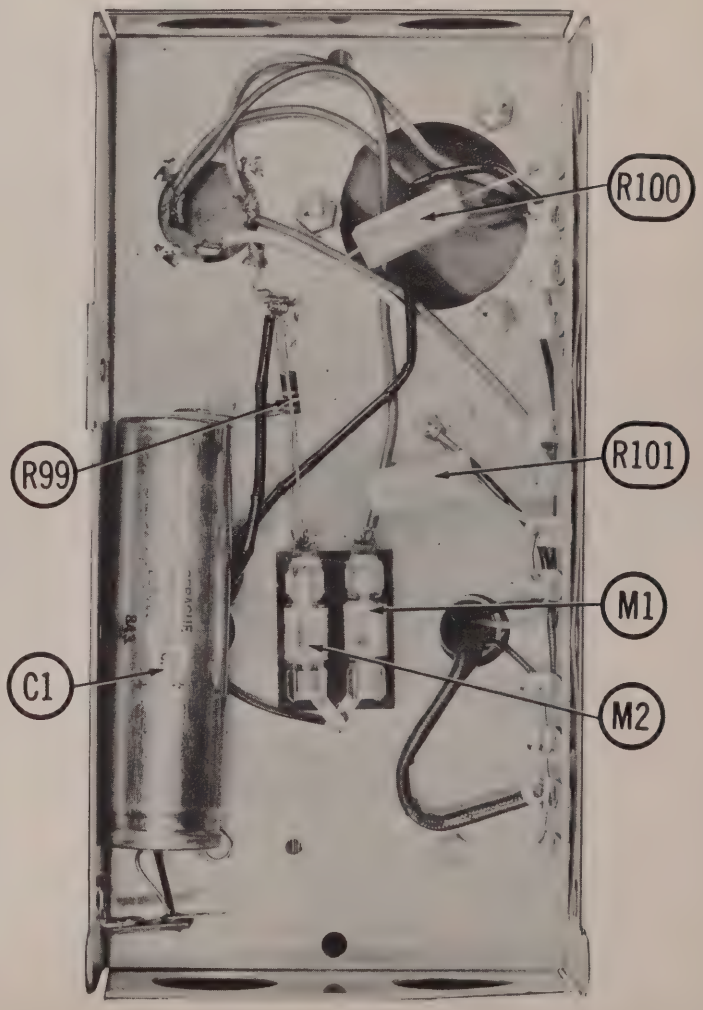
| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | Setchell-Carlson PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T6 | 7200Ω CT | 3-4Ω | TM1085 | 22S47 ① | A-2900 ① | AU-608 ① | A-3850 ① | 22S47 ① | S-53X ① | ① Drill new mounting holes. |



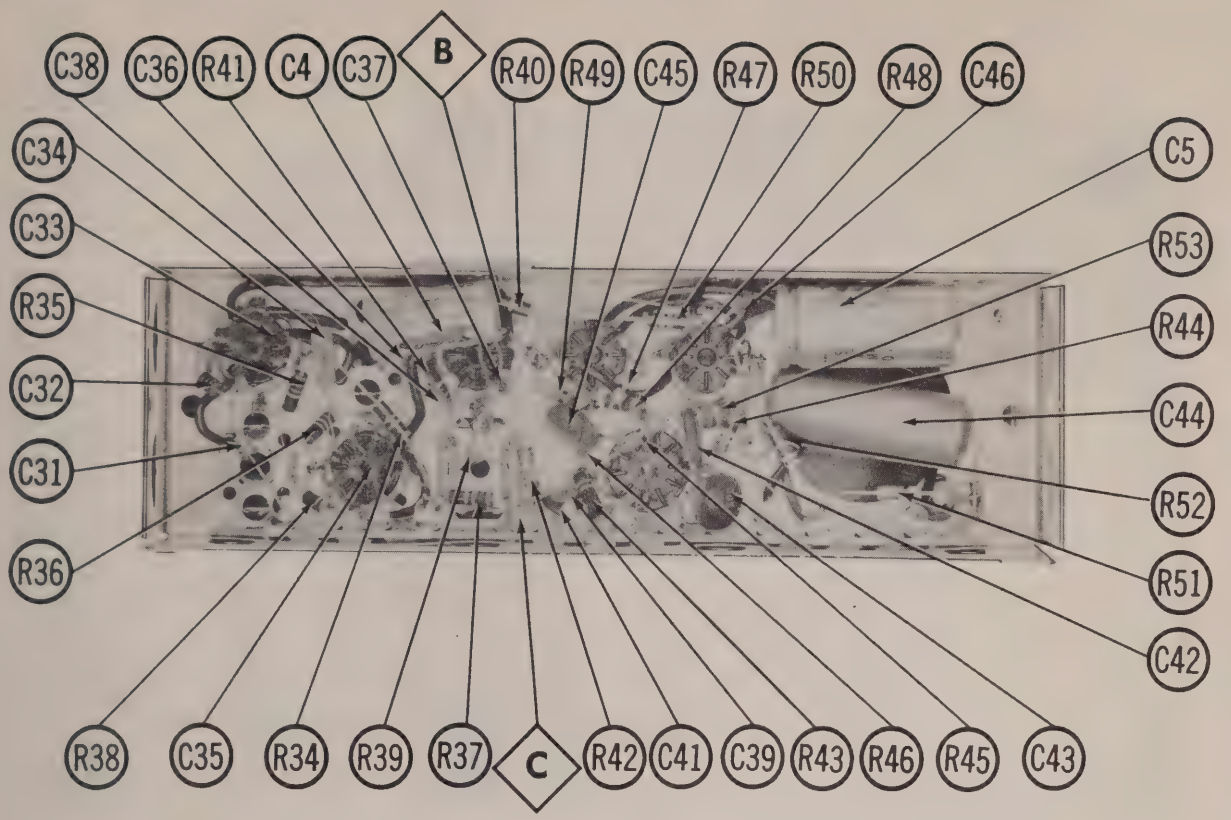

## ALTERNATE SCHEMATIC



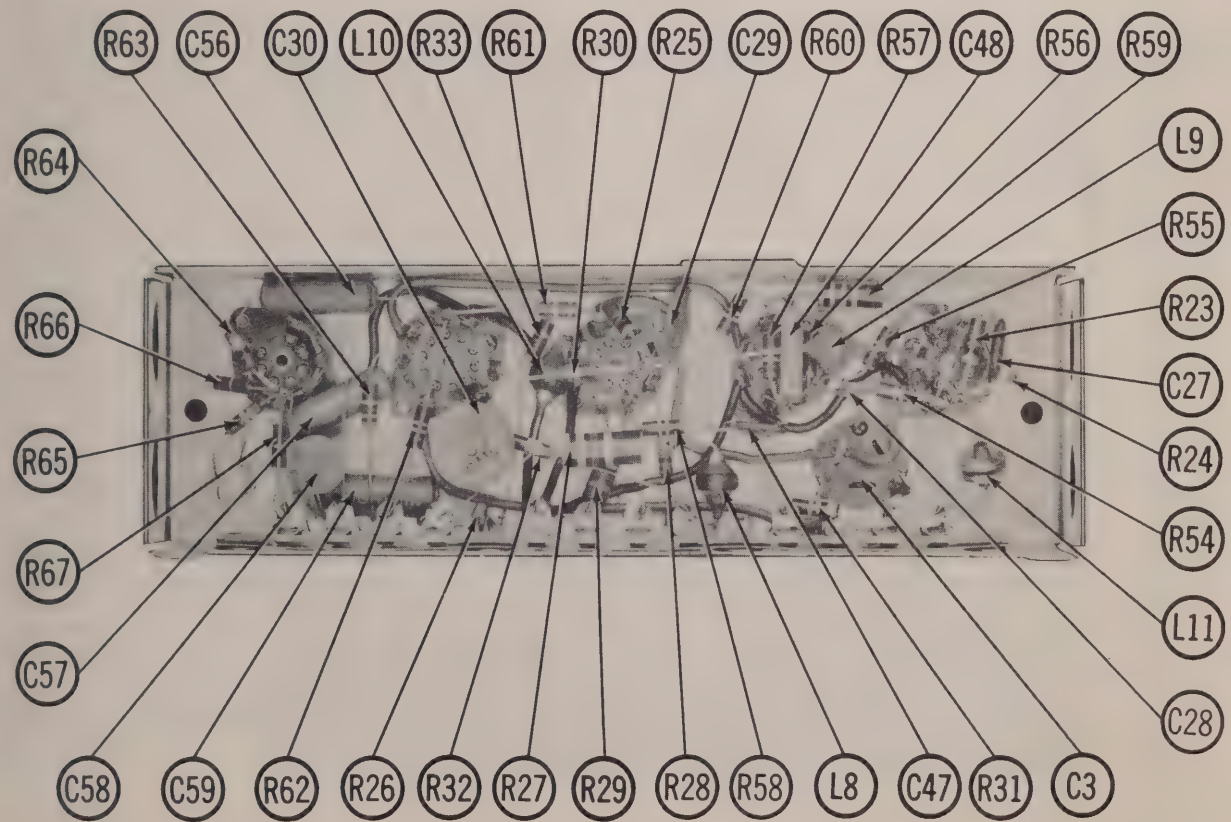

CHASSIS - BOTTOM VIEW



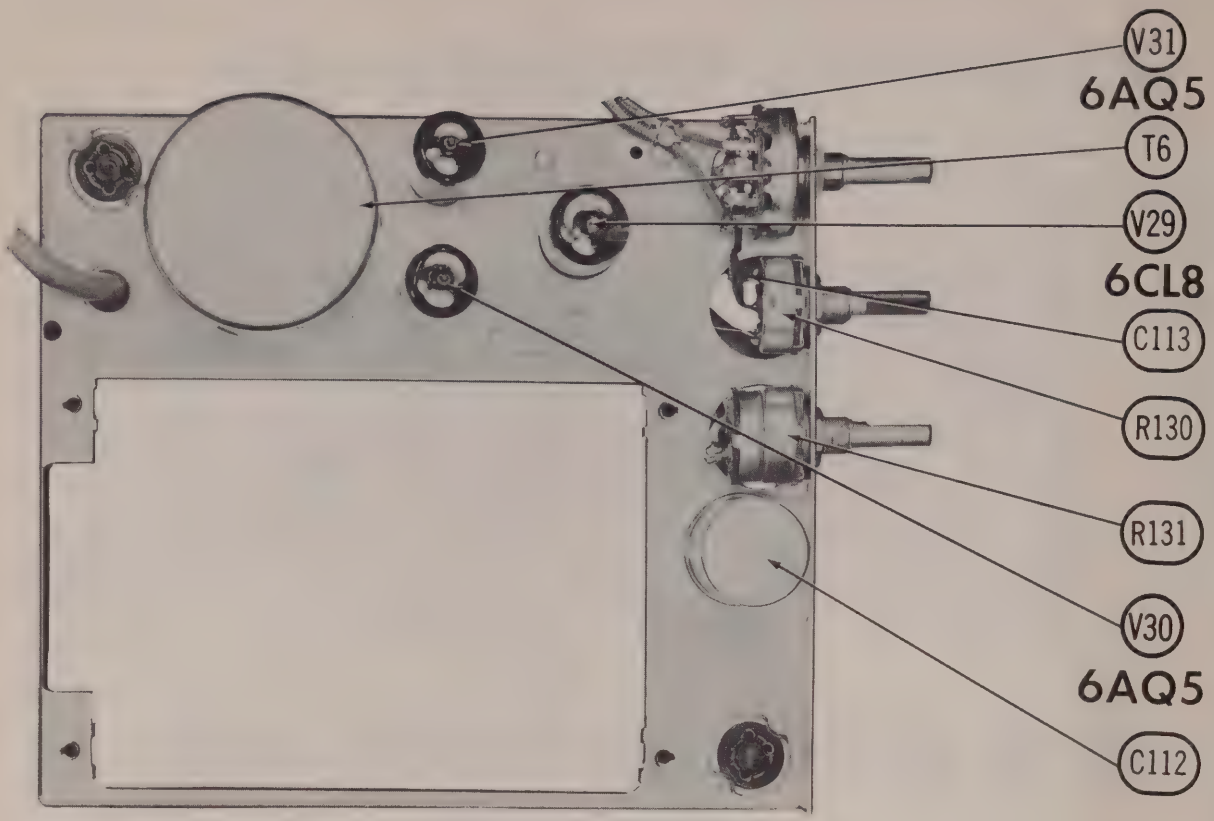

POWER SUB-CHASSIS



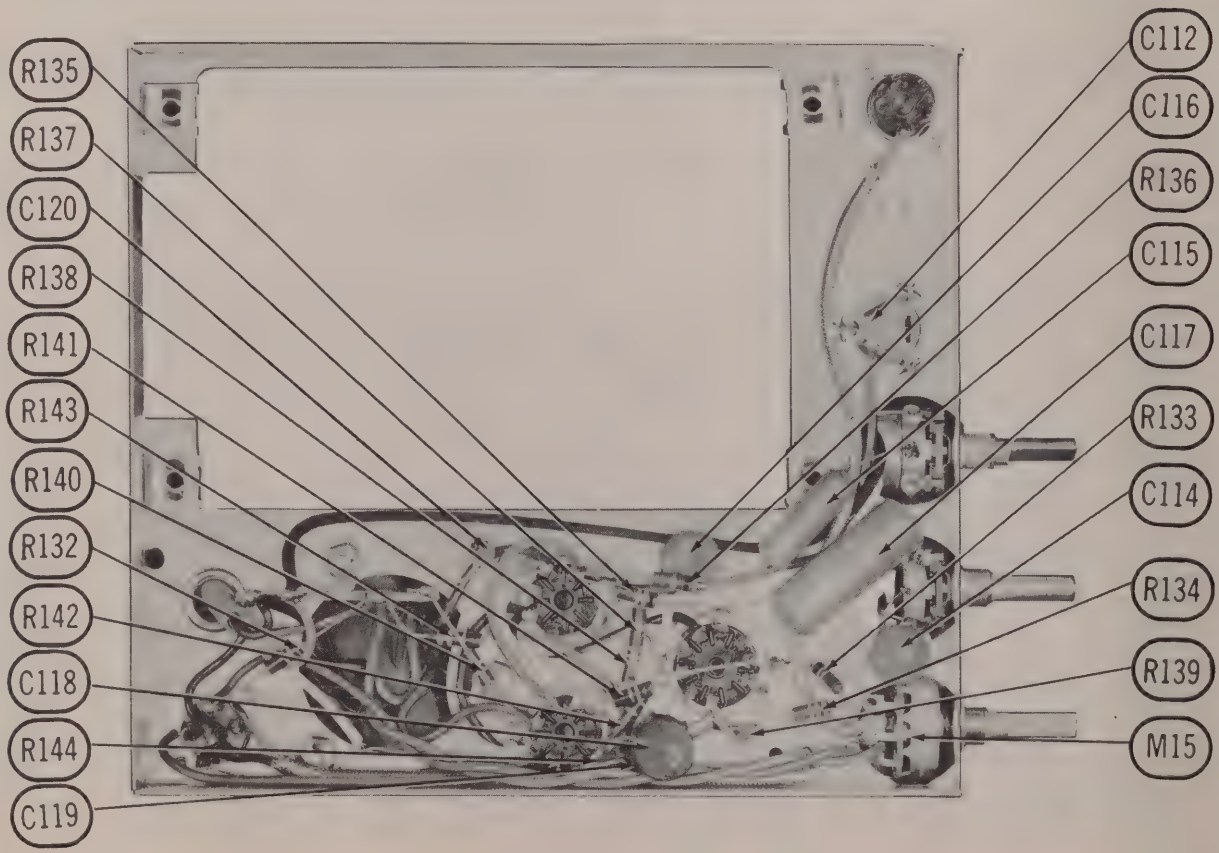

SOUND SUB-CHASSIS



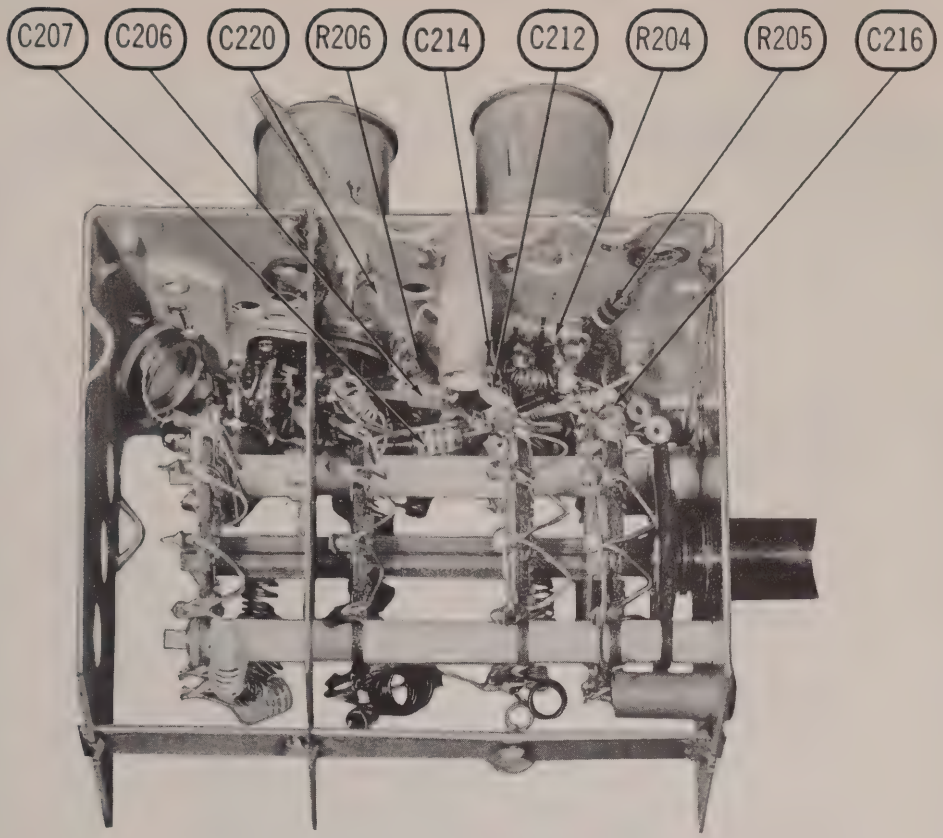

VIDEO, SYNC & AGC SUB-CHASSIS



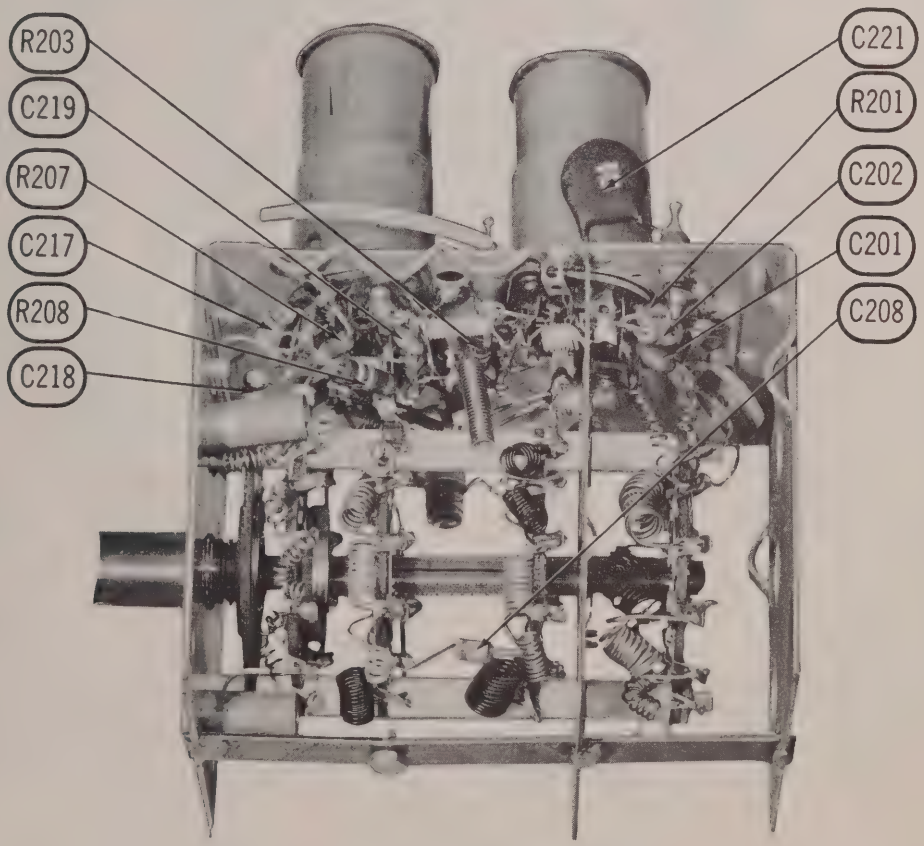

AMPLIFIER - TOP VIEW



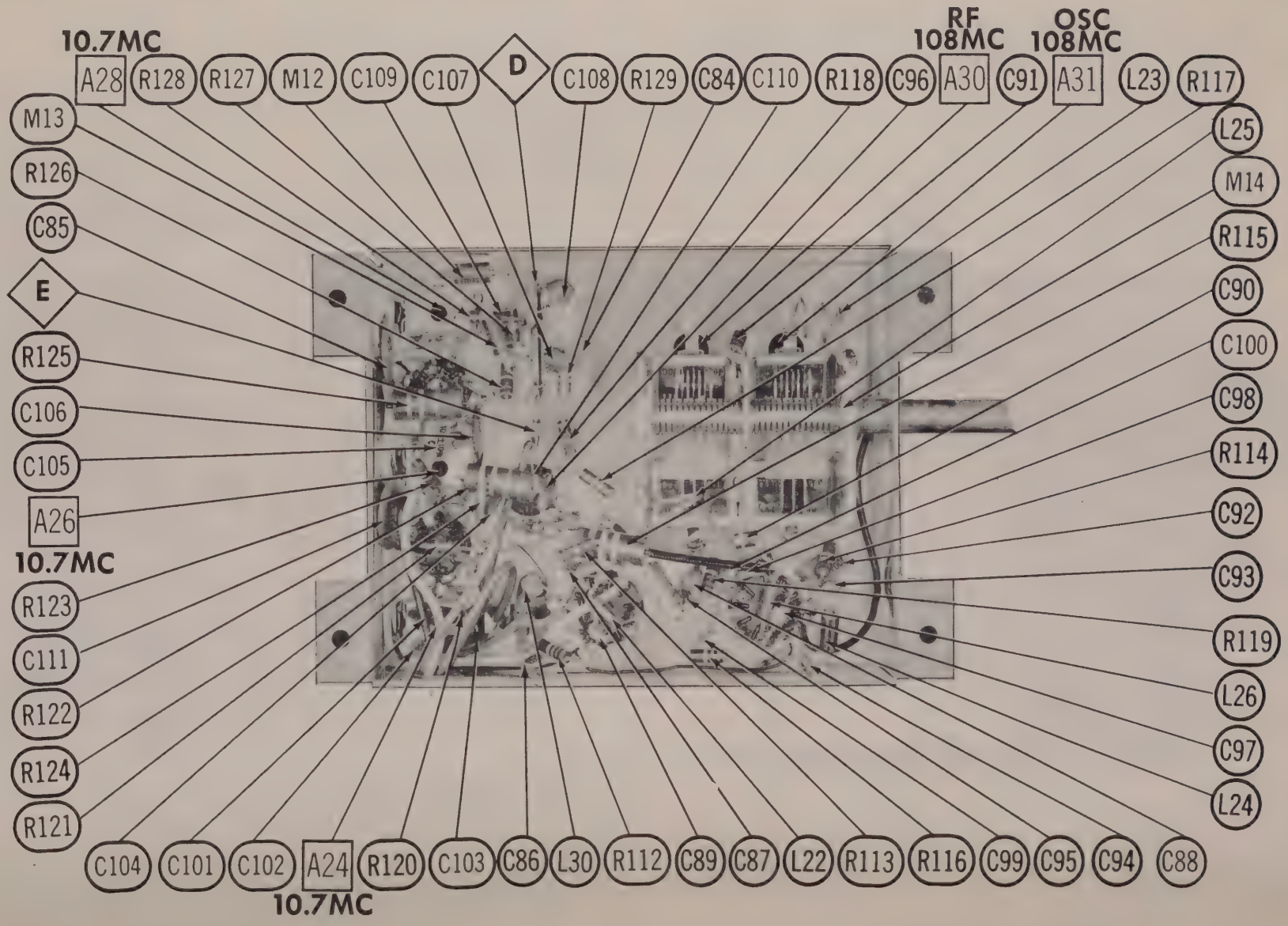

AMPLIFIER - BOTTOM VIEW




TUNER - LEFT SIDE




TUNER - RIGHT SIDE




FM TUNER - BOTTOM VIEW

CHASSIS - TOP VIEW

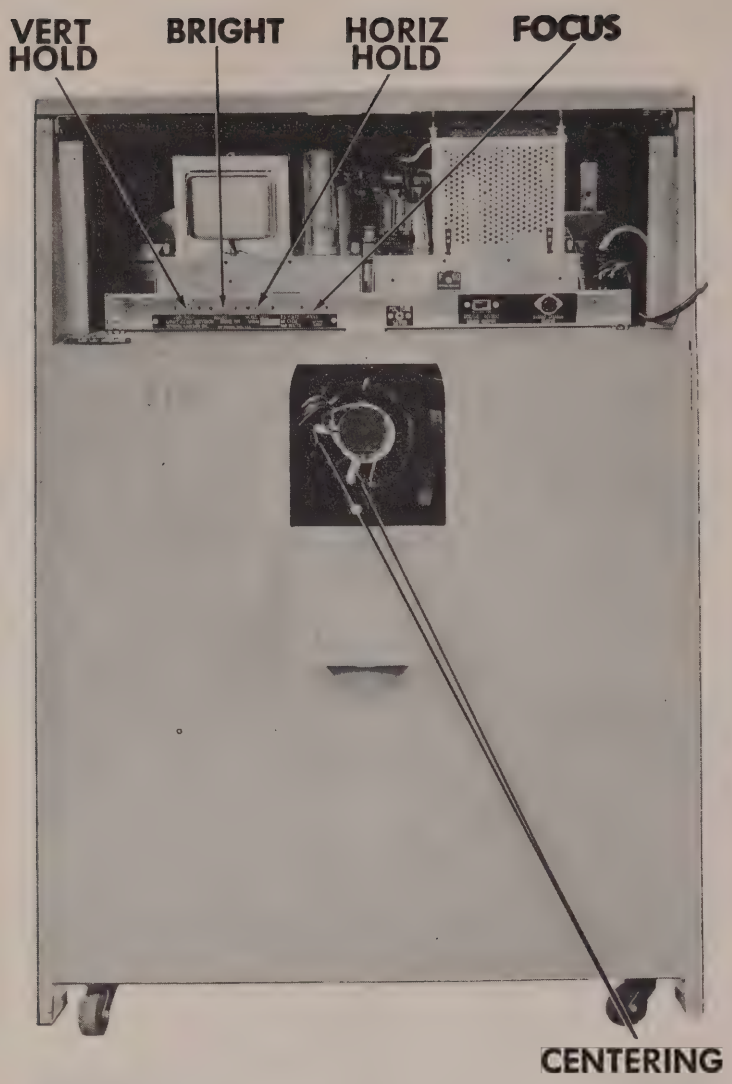
# RESISTANCE MEASUREMENTS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BZ6 | 220K | 470Ω | .1Ω | 0Ω | †2600Ω | †2600Ω | 470Ω | | |
| V2 | 6BZ6 | 220K | 550Ω | .1Ω | 0Ω | †2400Ω | †2400Ω | 470Ω | | |
| V3 | 6BZ6 | .1Ω | 180Ω | .1Ω | 0Ω | †2100Ω | †2100Ω | 180Ω | | |
| V4 | 6AU6 | 2.2meg | 0Ω | 0Ω | .1Ω | †5000Ω | †2000Ω | 0Ω | | |
| V5 | 6AQ5A | 1meg | ●350Ω | 0Ω | .1Ω | †3300Ω | †2000Ω | 1meg | | |
| V6 | 6AW8A | 6800Ω | †57K | †8800Ω | .1Ω | 0Ω | †3200Ω | †27K | †22K | 400K |
| V7 | 6AU6 | 2.5Ω | 0Ω | 0Ω | .1Ω | †17K | †17K | 180Ω | | |
| V8 | 6AU6 | 47K | 0Ω | 0Ω | .1Ω | †17K | †17K | 180Ω | | |
| V9 | 6AL5 | 6800Ω | 6800Ω | 0Ω | .1Ω | INF | 0Ω | INF | | |
| V10 | 6CL8 | 100K | †100K | 3900Ω | 0Ω | .1Ω | †100K | †1meg | 0Ω | 10meg |
| V11 | 6AQ5A | 1.1meg | 330Ω | 0Ω | .1Ω | †2200Ω | †6000Ω | 1.1meg | | |
| V12 | 6AQ5A | 1meg | 330Ω | 0Ω | .1Ω | †2230Ω | †6000Ω | 1meg | | |
| V13 | 6CS6 | †2.2meg | 0Ω | 0Ω | .1Ω | †57K | 35K | 2.2meg | | |
| V14 | 12AU7A | ●†1.6meg | ●1meg | 4700Ω | 0Ω | 0Ω | †220K | 0Ω | 4700Ω | .1Ω |
| V15 | 6V6GT | NC | 0Ω | †560Ω | †210Ω | 4.7meg | TP | .1Ω | ●850Ω | |
| V16 | 6AL5 | 22K | 22K | .1Ω | 0Ω | 4.8meg | 0Ω | 4.8meg | | |
| V17 | 12AU7A | †100K | ●80K | 1200Ω | .1Ω | .1Ω | †10K | 6.8meg | 1200Ω | 0Ω |
| V18 | 6DQ6A | TP | .1Ω | TP | †47K | 1meg | NC | 0Ω | 0Ω | TOP CAP ‡25Ω |
| V19 | 6AX4GT | TP | NC | ¶150K | NC | †0Ω | NC | .1Ω | 0Ω | |
| V20 | 1G3GT | | PINS | 1 THRU 8 | HAVE | INFINITE | RESISTANCE | | | TOP CAP ‡260Ω |
| V21 | 21CBP4A | 3.1Ω | 1meg | Pin 6 ●‡550K | Pin 10 ‡470K | Pin 11 ●650K | Pin 12 .1Ω | | | |
| V22 | 6BA6 | 3.7meg | 0Ω | .1Ω | 0Ω | †72Ω | †27K | 0Ω | | |
| V23 | 6BE6 | 22K | .5Ω | .1Ω | 0Ω | †13Ω | †27K | 2.7meg | | |
| V24 | 6BA6 | 2.7meg | 0Ω | .1Ω | 0Ω | †1200Ω | †27K | 0Ω | | |
| V25 | 12AT7 | INF | 0Ω | 120Ω | .1Ω | .1Ω | †470Ω | INF | INF | 0Ω |
| V26 | 12AT7 | †27K | 22K | .4Ω | .1Ω | .1Ω | †27K | 1.2meg | 1200Ω | 0Ω |
| V27 | 6AU6 | 13K | 13K | .1Ω | 0Ω | †12K | †12K | 13K | | |
| V28 | 6AU6 | 100K | 0Ω | .1Ω | 0Ω | 12K | 12K | 0Ω | | |
| V29 | 6CL8 | 10meg | 150K | 0Ω | 0Ω | .1Ω | †100K | †1.1meg | 0Ω | 10meg |
| V30 | 6AQ5 | 1meg | 330Ω | .1Ω | 0Ω | †200Ω | †3900Ω | 1meg | | |
| V31 | 6AQ5 | 1meg | 330Ω | .1Ω | 0Ω | †230Ω | †3900Ω | 1meg | | |
| V201 | 6BC8 | †0Ω | INF | INF | .1Ω | 0Ω | INF | 1.2meg | 0Ω | TP |
| V202 | 6CL8 | 15K | †6700Ω | 0Ω | .1Ω | 0Ω | †4200Ω | †2000Ω | 0Ω | 230K |
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 275V SOURCE.
‡ MEASURED FROM PIN 3 OF V19.

NC NO CONNECTION.
TP TIE POINT.

VIDEO IF SUB-CHASSIS




## CABINET—REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519

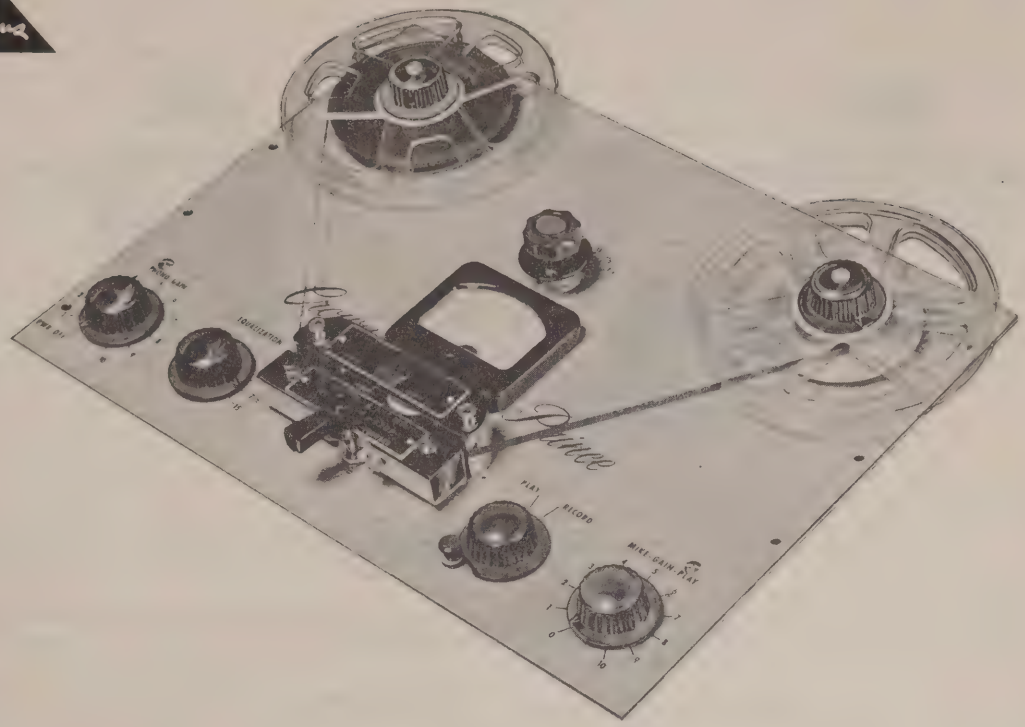
Turn the set on and tune in a TV signal, preferably with a test pattern.

Set the Horizontal Hold to the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

**CROWN MODEL**
**Prince**



## GENERAL INFORMATION

The Crown Prince recorder consists of two sections, the tape transport and the amplifier.

The tape transport is assembled on a steel plate and can be mounted on a rack or in a portable carrying case. All mechanical and electrical functions necessary for the operation of the tape drive are self-contained.

The amplifier contains all the elements necessary to supply the erase and record heads with power and to amplify the signal from the playback head. The output is of the cathode-follower type and can be used with a high-quality amplifier.

The tape transport accommodates all sizes of reels up to and including the standard NARTB 10 1/2-inch reel. Instantaneous selection between 15-7 1/2, and 3 3/4-ips tape speeds, with correction of equalization, is provided.

Dual or full-track recording heads are optional with this unit.

This recorder is designed to operate from a 110-120 volt AC, 60 cycle power source.

Manufactured by:
International Radio and Electronics Corporation
Elkhart, Indiana

*This material compiled and published by*

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C384

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CROWN MODEL
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CROWN MODEL
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SET 445 FOLDER 3

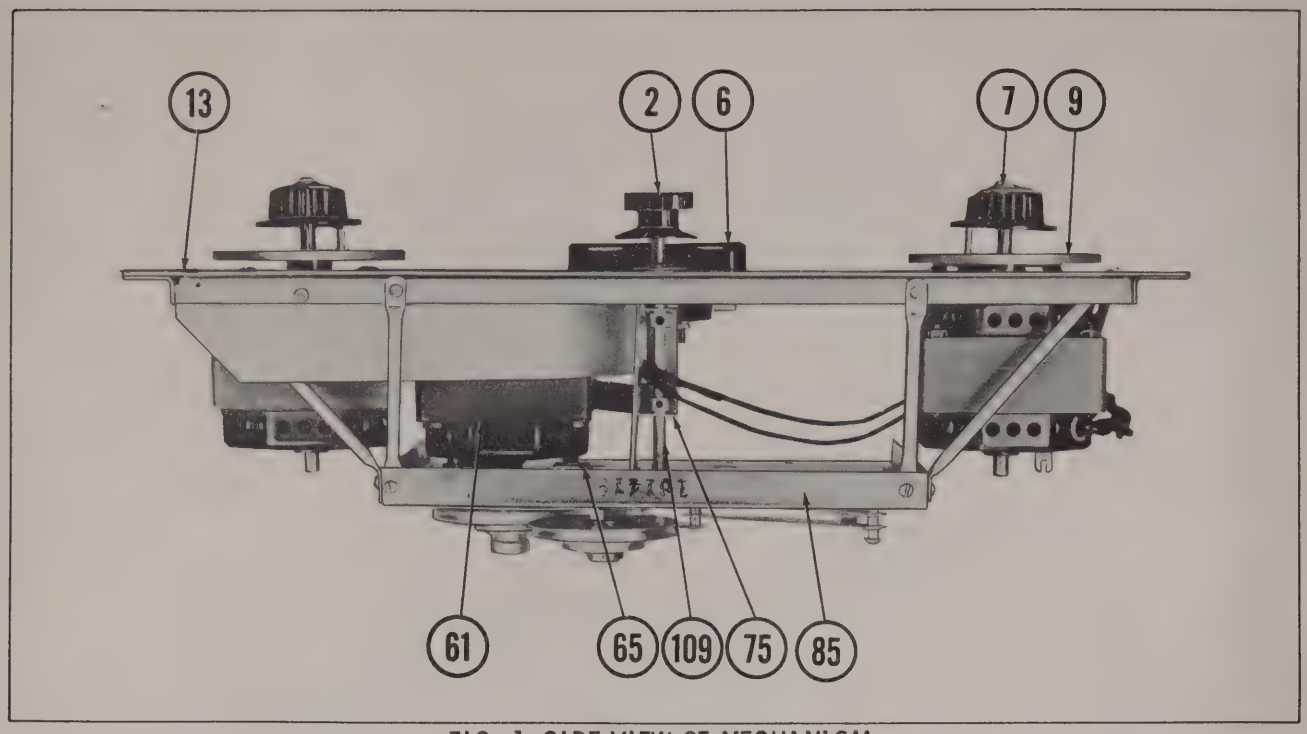



FIG. 1 SIDE VIEW OF MECHANISM

## FUNCTION OF CONTROLS, SWITCHES, AND INDICATORS

### Speed Shift

Selects 15-, 7 1/2-, or 3 3/4-ips speed. The speed is changed by turning the knob to the left, or Shift position, and then to the right for the desired speed. For 3 3/4 ips, the Speed Shift knob is pushed inward toward the recorder from the Shift position. For 7 1/2 ips, the Speed Shift knob is turned to that speed without being depressed. For 15 ips, the Speed Shift knob is pulled outward toward the operator from the Shift position.

NOTE: Do not change speeds unless the recorder is running.

### Phono Gain--On-Off

Volume control for phonograph. The power on-off switch also is operated by this knob.

### Equalization

For 15, - 7 1/2, - or 3 3/4-ips speeds.

### Control Switch

Controls the movement of the tape. The control switch knob has six positions and each position is clearly marked. The Thread-Idle position is at the left center. Always place the control switch knob in the Thread-Idle position when the recorder is not being used. The next position is the Stop position, then the Rewind position. Be sure to pause long enough in the Stop position to allow the tape to stop completely before reversing the direction of the tape. The Play-Record position is next at the right.

NOTE: Never leave the control switch knob in the Play-Record position when the recorder is not being used because flat spots will be produced on pressure roller (28). These flat spots later may cause wow and flutter.

The Stop and the Forward positions are next. The Forward position quickly reels the full reel of tape when the operator is cueing or looking for a special number on the tape. Be sure to pause long enough in the Stop position to allow the tape to stop completely.

### Play-Record and Record Button

The Play-Record control and the Record push-button place the amplifier in Record or Playback position.

### Microphone Gain

The Microphone Gain control also is the gain control for Playback, as well as for the microphone.

### Jacks

At the rear of the recorder are three jacks. From left to right, they are: Output, for connecting a power amplifier; Microphone, for connecting microphone; and Phono, for connecting a phonograph.

NOTE: : In models equipped with stereo playback, the Stereo Output jack is directly above the regular output jack.

### VU Meter

For recording level indication.

## Threading Tape

1. Place a reel of tape on left reel flange (9) and an empty reel on right reel flange (9); make sure reel slots engage flange pin on reel flange.

2. Unwind about twelve inches of tape from the reel. Hold a section of tape taut with both hands and insert the tape into the tape slot; make sure the dull-coated side of tape faces the heads.

3. Insert the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel several turns counterclockwise until the tape is secured to the reel and all slack is taken up between reels.

## To Make a Recording

1. Thread tape as described under "Threading Tape."

2. Turn the amplifier controls to the left, or minimum position.

3. Plug the power cord into the receptacle at the rear of the recorder and into a 110-volt, 60-cycle AC source.

4. Turn the Phono Gain--On-Off control to the On position and allow the recorder to warm up for at least five minutes.

5. Push in the Record button and turn the Play-Record knob to the Record position indicated by the red light in the VU Meter.

6. Insert the microphone plug into the microphone jack at the rear of the panel. Do not plug in the microphone or phonograph with the volume controls turned up. Always turn the volume controls to the minimum position to prevent damage to the equipment.

7. Start the tape movement by snapping the control switch knob to the Play-Record position.

8. Turn the Microphone Gain control until the VU Meter indicates that the signal is at the proper level for recording. Control the recording level with peaks of not more than 100 on the VU Meter.

9. After the recording is completed, turn the Play-Record control to the Play position and then rewind the tape. Do not attempt to rewind the tape when the control is in the Record position. As a safety measure, all power to the rewind motor is cut off to prevent accidental erasure of the tape when the unit is in the Record position.

## To Play Back a Recording

1. Thread tape as described under "Threading Tape."

2. Turn the amplifier controls to the left, or minimum position.

3. Plug the power cord into the receptacle at the rear of the recorder and into a 110-volt, 60-cycle AC Source.

4. Turn the Phono Gain--On-Off control to the On position and allow the recorder to warm up for at least five minutes.

5. Make sure the Play-Record control is on Play and the red light in the VU Meter is off.

6. Start the tape movement by snapping the control switch knob to the Play-Record position.

7. Turn the Microphone Gain-Play control to the desired volume. Do not turn the volume control to maximum.

## Dual-Track Recording

The Model CPD records one-half the tape width at a time and thus permits dual-track recording. This two-track operation is as follows:

1. After a reel of tape has been recorded (i.e., all the tape has been wound onto the right reel), turn the control switch knob to the Stop position.

2. Remove the reels from the recorder. Turn over the full reel and place it on the left reel flange; turn over the empty reel and place it on the right reel flange.

3. Thread the tape properly and proceed with the recording.

4. After the second track has been recorded, the first track can be played, without rewinding, by reversing the reel as described in Step 2 in the foregoing.

NOTE: Since the Model CPF is a full-track recorder, the dual-track recording explanation does not apply to it.

## To Edit and Splice Tape

NOTE: Since one track cannot be edited and spliced without affecting the other, recordings to be edited should be limited to one track only.

1. The tape can be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements, etc., can be inserted between selections. Unused sections of tape can be spliced for re-use.

2. For best results, cut tape at a slight diagonal, join ends with splicing tape on the glossy side, and trim any excess width.

## Mixing Microphone and Phonograph Records

1. To record from both a phonograph and a microphone, set recorder as described "To Make a Recording."

2. Insert the plug from the phonograph into the Phono Input jack. Control the volume with the recorder volume control.

## TAPE TRANSPORT OPERATION

Electromagnetic braking is employed in this recorder and is accomplished by applying DC to the motors. When the unit is switched from Fast Forward to Stop, there are 9 volts DC on take-up motor (59) and 17 volts DC on rewind motor (84). When the unit is switched from Rewind to Stop, there are 9 volts DC on rewind motor (84) and 17 volts DC on take-up motor (59). DC for the brake voltage is furnished by selenium rectifier M1.

A six-position switch M10 operates the transport system. When the switch is operated, a deliberate snapping motion, rather than a squeezing motion, must be used when the switch is turned. As long as the switch is moved one position at a time and the tape is allowed to stop completely in the Stop position, the switch will be easy to operate. A tape loop will be formed if the switch is moved too slowly from the Thread-Idle position to the Play-Record position.

The only time the tape contacts the heads is when the unit is in the Play-Record position. This action is accomplished by cam (29) on the control switch shaft. Return spring (44) under pressure bar (25) holds the bar away from the heads in all positions except Play-Record.

## ADJUSTMENTS

### Timing

If the tape is running too fast, socket head capscrew (48) under outer pressure bar (47) should be tightened a few turns. If the tape is running too slow, socket head capscrew (48) should be loosened a few turns. These adjustments are intended to be corrections for not more than +15 seconds in one-half hour. A spring tension of not less than four pounds should be maintained on pressure roller (28) to pull the tape between pressure roller (28) and the capstan.

### Heads

The heads are mechanically and electrically prealigned at the factory. The following instructions are given should the alignment need rechecking. Before starting, demagnetize all tools which might contact the head assembly to avoid magnetizing the heads. In a dual-track recorder, erasure and recording is done on the front half of the tape. A plastic transparent straight edge will make the checking of the head positioning much easier. With the head assembly removed from the recorder, measure the distance from the panel of the recorder to the edge of pressure pads (24B). This distance should measure 17/32" for both pads. If necessary, pressure pad spring (24) can be moved by loosening screws (22).

After the pressure pads are properly adjusted, place the head assembly on the recorder; make sure the pads are seating properly against the heads. Remove upper name plate (15). Connect a VTVM or oscilloscope to the recorder output, and play a 10,000-cycle alignment tape. Set the playback controls to a nominal amount, and note the position of all head alignment screws (17). Then align with right screw only, noting how far it is moved. If this screw must be moved (for instance, one and one-half turns to the right for proper electrical alignment), it should then be turned to the left one-quarter turn; the two left alignment screws should also be turned one-quarter turn to the left to maintain proper mechanical alignment. Adjust the head to give maximum output, but leave the gain controls fixed.

### Bias Adjustment

If the bias should need checking or adjustment, use the following procedure:

An audio generator and a sensitive VTVM capable of measuring variations accurately in the range of 0 to 2 volts at 70 to 75 kc are required. Connect a 1,000-ohm resistor in series with the ground side of the record head. Connect the VTVM across the resistor. With the recorder in the Record position, adjust bias oscillator slug A1 for a VTVM reading of 1.9 volts for full width and .55 volt for half width and series "A" recorders. Check distortion at full record level with 400 cycles, as indicated on the record level meter when the unit is in the Play-Record position. An indication of less than 2% should be obtained.

## MAINTENANCE

### Lubrication

All moving parts of the recorder mechanism operate in lubricated oilite bearings; therefore, little oil is required. The motors, pressure roller bearing, and speed shift idler bearing should be oiled lightly after 1,000 hours of operation or one year. Bearing housing assembly (69) should be oiled after 3,000 hours of operation. If any oil seeps to the outer edge of the moving parts and causes slippage in the drive mechanism, wipe all affected parts with a clean, soft cloth and carbon tetrachloride. For lubrication, Bardahl Sinclair or an equivalent household oil is recommended.

CAUTION: Do not overlubricate. Two drops of oil on each motor bearing are sufficient.

### Cleaning

Excessive oil or dirt on moving parts should be removed with a clean, soft cloth and carbon tetrachloride. If the recorder is used frequently, the recording heads and pads should be cleaned once a week. The heads should be cleaned with a clean, soft cloth; and the pads should be cleaned with a brush. Dirty pressure pads will shorten the life of the recording heads, and dirty heads will cause low record level and poor erase.

### Demagnetization

Magnetized heads cause hissing noises and distortion. The head on the recorder should be demagnetized occasiionally to avoid these troubles. To demagnetize the heads, remove the head assembly and place it in contact with a bulk tape eraser or a head demagnetizer. First switch on the demagnetizer, then bring the head close to the demagnetizer on all sides of the head assembly. Finally move the head assembly slowly away from the demagnetizer about two feet before switching off the demagnetizer.

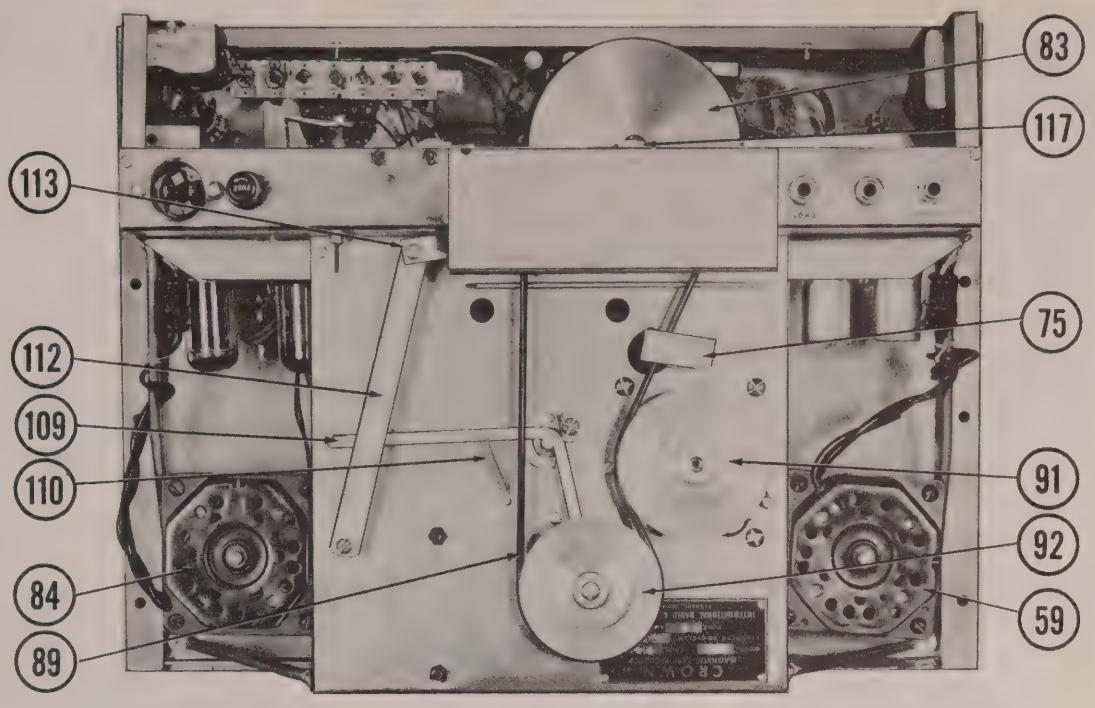



FIG. 2 BOTTOM VIEW OF MECHANISM

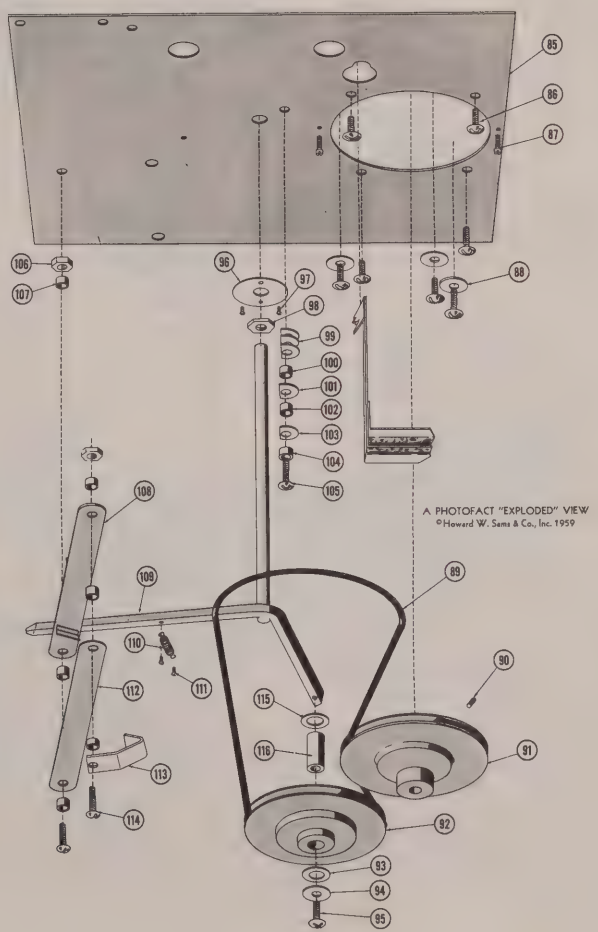



FIG. 3A EXPLODED VIEW OF SPEED CHANGE MECHANISM

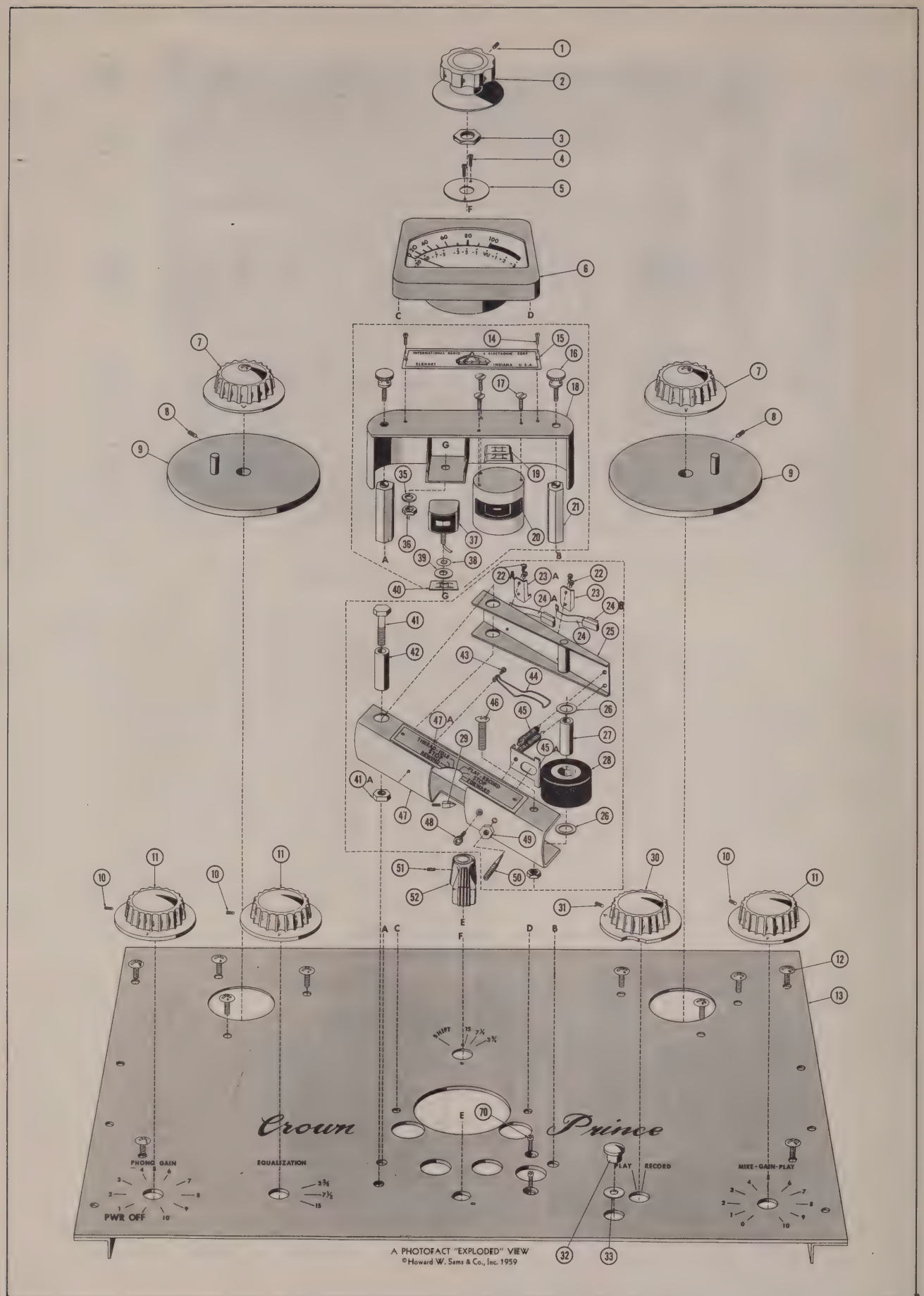



FIG. 3B EXPLODED VIEW OF PARTS ABOVE BASEPLATE

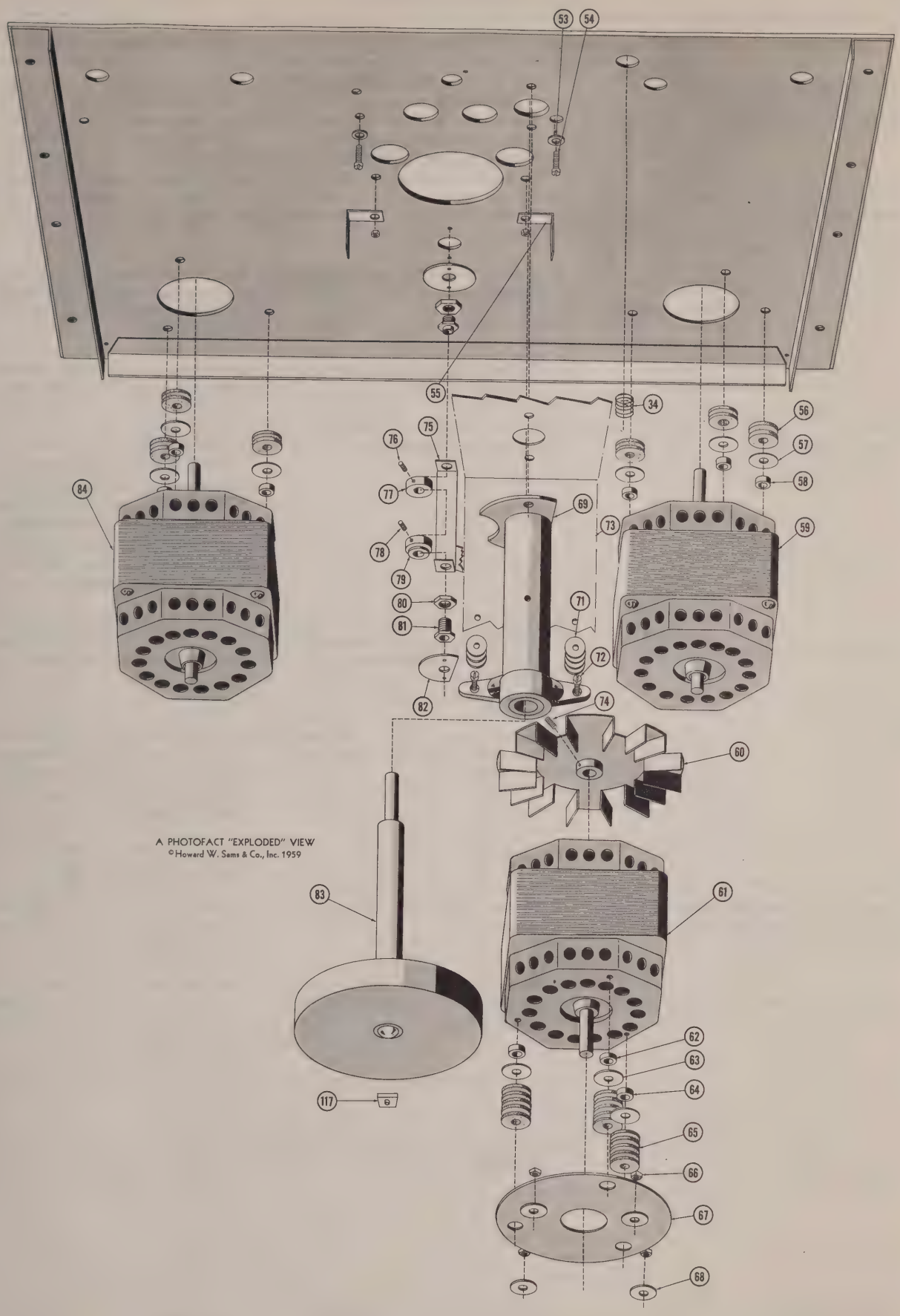



FIG. 3C EXPLODED VIEW OF PARTS BELOW BASEPLATE

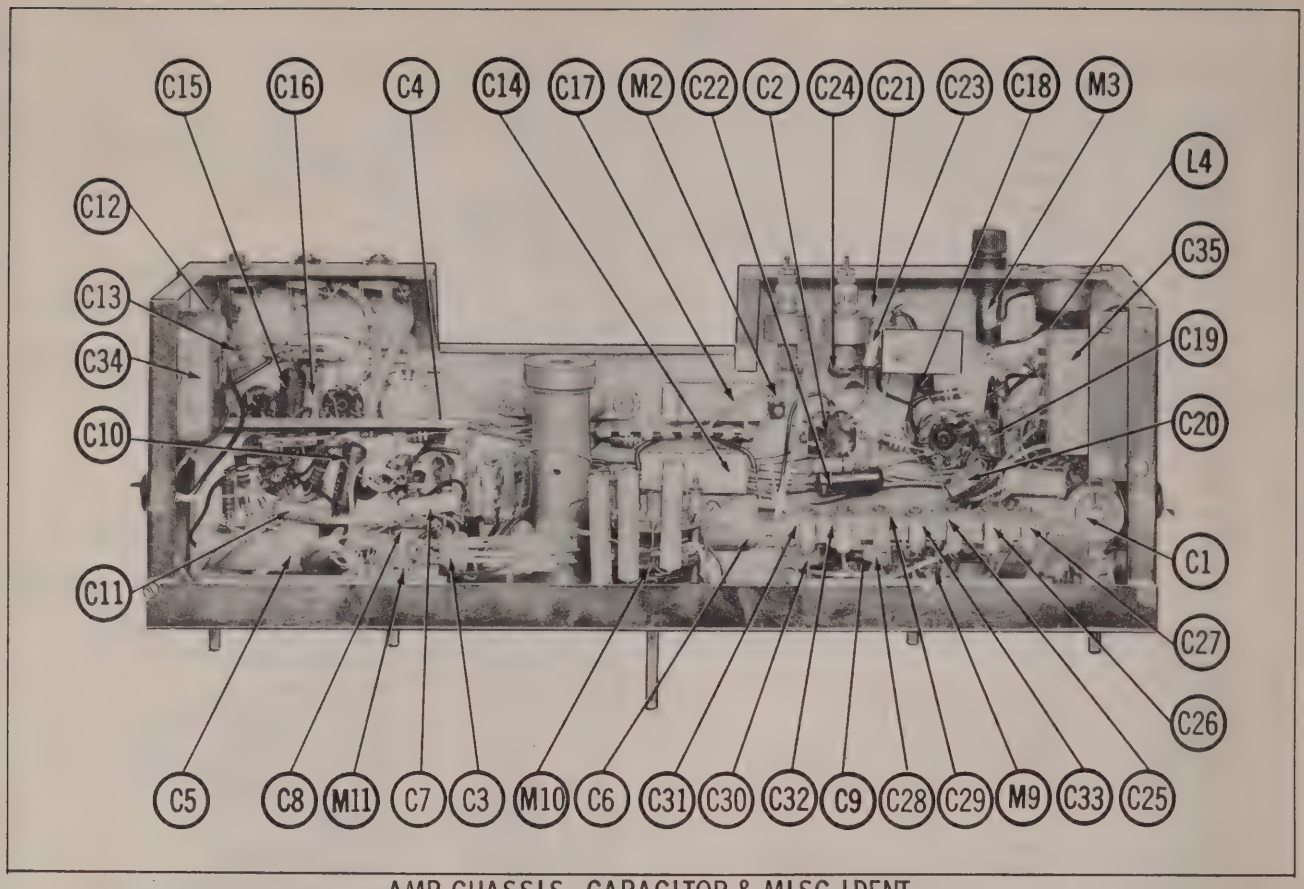
## TROUBLE CHART

| Symptom | Cause | Remedy |
|---|---|---|
| Not enough torque in motors. | 1. All motors have egg-shaped bronze oilite bearings. While the recorder is being handled, it may be jarred sufficiently to pull these bearings slightly out of adjustment. | 1. Allow the motor to run without a reel on the unit. Lightly tap each end of the motor shaft crosswise with a screwdriver handle, or lightly tap the motor with a tack hammer. |
| Tape breaks. | 1. Tape wound too loosely on reel. | 1. Rewind tape. |
| | 2. Control switch knob operated improperly. | 2. Use a deliberate snapping motion rather than a squeezing motion when operating control switch knob. |
| | 3. Different size reels are used together. | 3. Only the same size reels should be used on both reel flanges. |
| Wow and flutter | 1. Drive belt (89) slips. | 1. Drive belt (89) should be replaced if it has stretched or has become saturated with oil. The belt also will slip if there is a film of oil on flywheel (83). Wipe any oil from affected parts with a clean cloth and carbon tetrachloride. |
| | 2. Defective pressure roller (28). Caused by recorder sitting for a long time in the Play-Record position with the unit not running. | 2. To remove depression in pressure roller (28), play the recorder for a few hours. |
| | 3. Insufficient pull between pressure roller (28) and capstan. | 3. Clean pressure roller (28) and the capstan; increase the tension by adjusting socket head capscrew (48), as described under "Timing." |
| | 4. Capstan eccentric. | 4. Replace flywheel, shaft, and capstan assembly (83). |
| Tape drive does not operate when unit is in Play-Record. | 1. Drive belt (89) loose or broken. | 1. Replace drive belt (89) if broken; reposition drive belt (89) if loose. |
| | 2. Defective drive motor (61). | 2. Replace drive motor (61). |
| Poor response. | 1. Dirty heads. | 1. Clean heads with a soft cloth and carbon tetrachloride. |
| | 2. Improper head alignment. | 2. Align heads as described under "Heads." |
| | 3. Improper pressure pad tension. | 3. Pressure pads (24B) should sit horizontally on the heads with only a slight tension, as described under "Heads." |
| | 4. Worn heads. | 4. When the heads have had considerable use and show wear, they should be replaced. |
| Electromagnetic braking fails to stop tape. | 1. Selenium M1 or a component defective. | 1. Check circuit for defective component (s). |

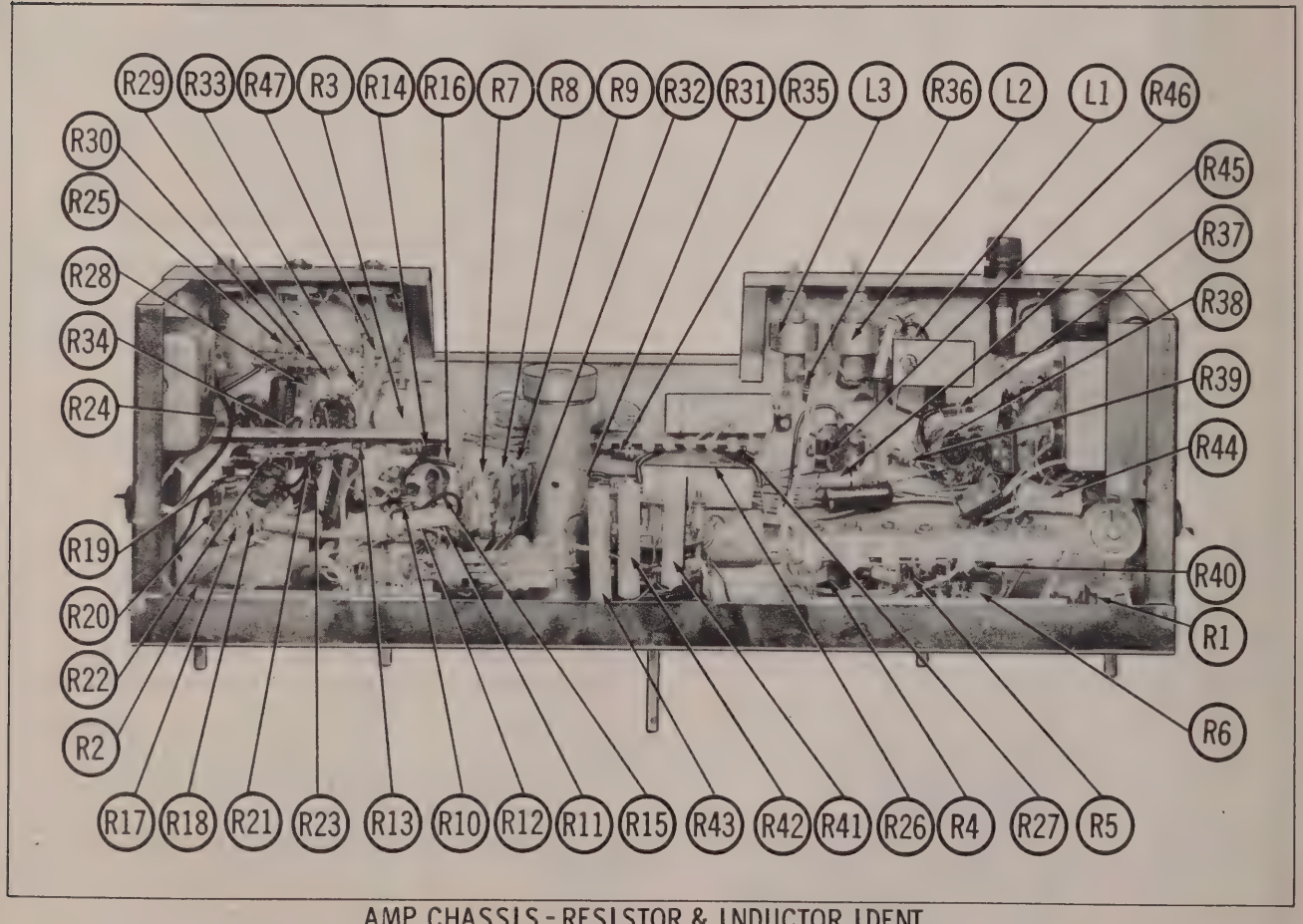
# MECHANICAL PARTS LIST

| Ref. No. | Part No. | Description |
|---|---|---|
| 1 | PR-1 | Set Screw (8-32 X 3/16") |
| 2 | PR-2 | Speed Shift Knob |
| 3 | PR-3 | Hex Nut |
| 4 | PR-4 | Bushing Mtg. Screws (#2 X 3/8") |
| 5 | PR-5 | Bushing Mounting Washer |
| 6 | PR-6 | VU Meter |
| 7 | PR-7 | Reel Hold-down Knobs |
| 8 | PR-8 | Set Screw (10-32 X 3/16") |
| 9 | PR-9 | Reel Flange (2) |
| 10 | PR-10 | Set Screw (3) (6-32 X 5/8") |
| 11 | PR-11 | Phono Gain, Equalization, Mike-Gain-Play Knob |
| 12 | PR-12 | Front Panel Mtg. Screws |
| 13 | PR-13 | Front Panel |
| 14 | Pr-14 | Name Plate Mtg. Screws (2) |
| 15 | PR-15 | Upper Name Plate |
| 16 | PR-16 | Thumb Screws (2) (8-32 X 1/2") |
| 17 | PR-17 | Play-Record Head Alignment Screws (3)(3-48 X 3/8") |
| 18 | PR-18 | Head Cover |
| 19 | PR-19 | Speed Nuts |
| 20 | PR-20 | Play-Record Head |
| 21 | PR-21 | Head Mtg. Posts (2) |
| 22A | PR-22A | Left Tape Guide Screw (2) |
| 22 | PR-22 | Right Tape Guide Screws (2) |
| 23 | PR-23 | Right Tape Guide |
| 23A | PR-23A | Left Tape Guide |
| 24 | PR-24 | Right Pressure Pad Spring |
| 24A | PR-24A | Left Pressure Pad Spring |
| 24B | PR-24B | Pressure Pads (2) |
| 25 | PR-25 | Inner Pressure Bar |
| 26 | PR-26 | Pressure Roller Washers (2) |
| 27 | PR-27 | Pressure Roller Shaft |
| 28 | PR-28 | Pressure Roller |
| 29 | PR-29 | Cam |
| 30 | PR-30 | Play-Record Knob |
| 31 | PR-31 | Set Screw (6-32 X 5/8") |
| 32 | PR-32 | Record Button |
| 33 | PR-33 | Washer |
| 34 | PR-34 | Record Lock Spring |
| 35 | PR-35 | Fiber Washer |
| 36 | PR-36 | Hex Nut |
| 37 | PR-37 | Erase Head |
| 38 | PR-38 | Lockwasher |
| 39 | PR-39 | Washer |
| 40 | PR-40 | Speed Nut |
| 41 | PR-41 | Pivot Bolt |
| 41A | PR-41A | Pivot Nut |
| 42 | PR-42 | Sleeve |
| 43 | PR-43 | Return Spring Mtg. Screw |
| 44 | PR-44 | Return Spring |
| 45 | PR-45 | Tension Spring (2) |
| 45A | PR-45A | Tension Adjuster |
| 46 | PR-46 | Screw (8-32 X 1" trimmit) |
| 47 | PR-47 | Outer pressure Bar |
| 47A | PR-47A | Lower Name Plate |
| 48 | PR-48 | Socket Head Capscrew (6-32 X 1/2") |
| 49 | PR-49 | Lock Nut (10-32) |
| 50 | PR-50 | Inner Pressure Bar Action Adj. Stud (10-32 X 1 1/4") |
| 51 | PR-51 | Set Screw (8-32 X 1/4") |
| 52 | PR-52 | Control Switch Knob |
| 53 | PR-53 | Lock Washer (10-32) |
| 54 | PR-54 | Head Mounting Post Screw |
| 55 | PR-55 | Pilot Light Mtg. Bracket |
| 56 | PR-56 | Hard Motor Mount Grommets |
| 57 | PR-57 | Motor Mount Washer |

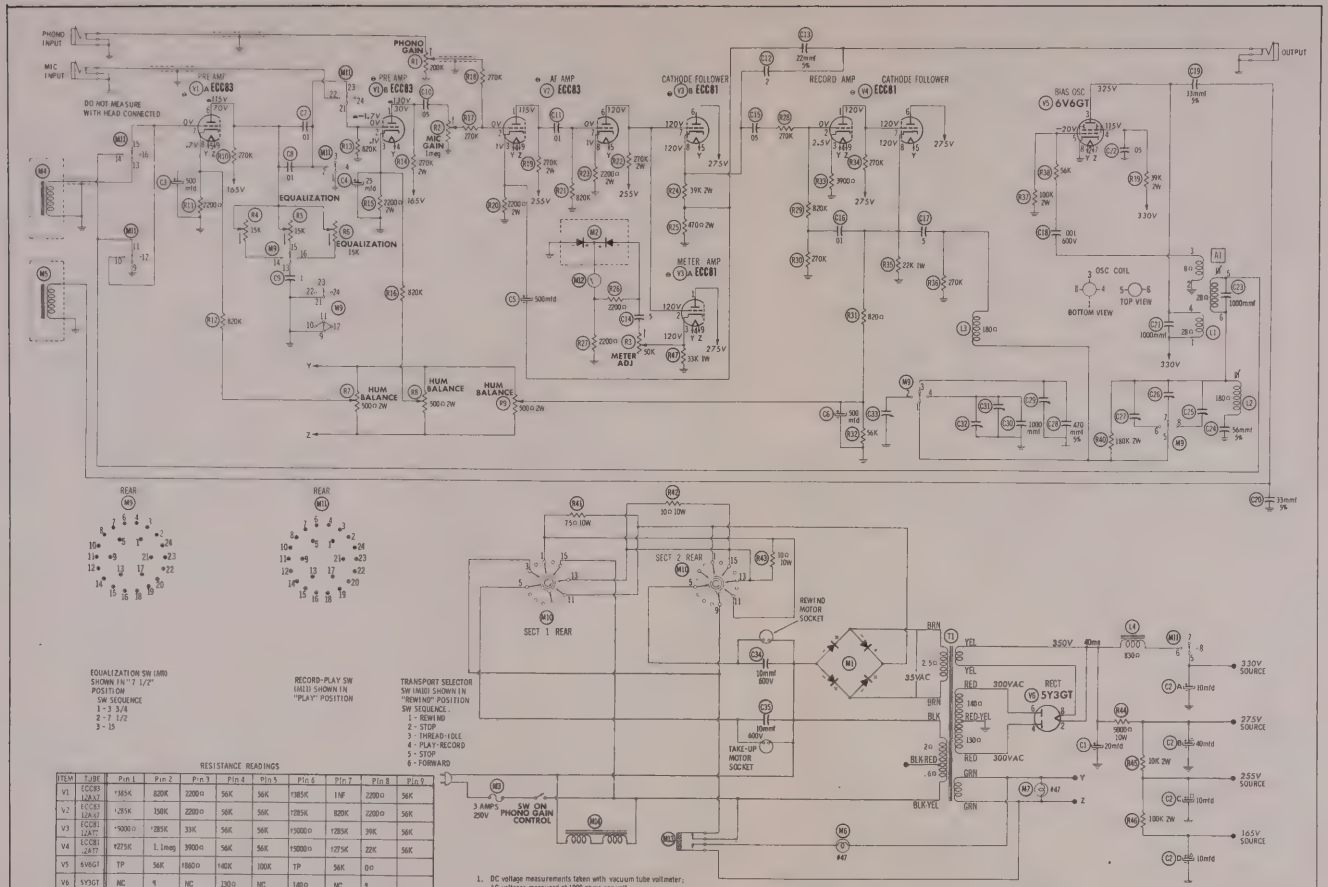
| Ref. No. | Part No. | Description |
|---|---|---|
| 58 | | This spacer is an integral part of the motor and cannot be removed. |
| 59 | PR-59 | Take-up Motor |
| 60 | PR-60 | Fan |
| 61 | PR-61 | Drive Motor |
| 62 | | This spacer is an integral part of the motor and cannot be removed. |
| 63 | PR-63 | Washer |
| 64 | | This spacer is an integral part of the motor and cannot be removed. |
| 65 | PR-65 | Soft Motor Mount Grommet |
| 66 | PR-66 | Hex Nut (8-32) |
| 67 | PR-67 | Drive Motor Plate |
| 68 | PR-68 | Washer |
| 69 | PR-69 | Bearing Housing Assembly |
| 70 | PR-70 | *Screw (8-32 X 1/2" FHMS). |
| 71 | PR-71 | Washers |
| 72 | PR-72 | Screws (2) (8-32 X 5/8" trimmet head) |
| 73 | PR-73 | Part of Amplifier Chassis |
| 74 | PR-74 | Set Screw (8-32 X 1/4") |
| 75 | PR-75 | Belt Guide |
| 76 | PR-76 | Set Screw (8-32 X 1/4") |
| 77 | PR-77 | Collar (Upper) |
| 78 | PR-78 | Set Screw (8-32 X 1/4") |
| 79 | PR-79 | Collar (Lower) |
| 80 | PR-80 | Hex Nut |
| 81 | PR-81 | Bushing |
| 82 | PR-82 | Mounting Plate |
| 83 | PR-83 | Flywheel, Shaft, Capstan Ass'y |
| 84 | PR-84 | Rewind Motor |
| 85 | PR-85 | Drive Motor Panel |
| 86 | PR-86 | Motor Mtg. Screw (8-32 X 3/8") |
| 87 | PR-87 | Screw (6-32 X 1/4" Self-Tapping) |
| 88 | PR-88 | Washer |
| 89 | PR-89 | Drive Belt |
| 90 | PR-90 | Set Screw (10-32 X 3/8") |
| 91 | PR-91 | Drive Pulley |
| 92 | PR-92 | Idler Pulley |
| 93 | | Washer (Same as Pr-26) |
| 94 | PR-94 | Washer |
| 95 | PR-95 | Idler Pulley Mtg. Screw (8-32 X 1" trimmit head) |
| 96 | PR-96 | Rear Bushing Mtg. Plate (2) |
| 97 | PR-97 | Screws (2) (2 X 3/8" Self-Tapping) |
| 98 | PR-98 | Hex Nut |
| 99 | PR-99 | Speed Shift Washer (3) |
| 100 | PR-100 | Spacer |
| 101 | PR-101 | Speed Shift Washer |
| 102 | PR-102 | Spacer |
| 103 | PR-103 | Speed Shift Washer |
| 104 | PR-104 | Spacer |
| 105 | PR-105 | Screw (8-32 X 1 1/8" trimmit head) |
| 106 | PR-106 | Hex nut (10-32) |
| 107 | PR-107 | Spacer |
| 108 | PR-108 | Speed Guide Bar (Upper) |
| 109 | PR-109 | Speed Shift Arm & Shaft Ass'y. |
| 110 | PR-110 | Speed Shift Arm & Shaft Ass'y. Tension Spring |
| 111 | PR-111 | Tension Spring Mtg. Screw (2) |
| 112 | PR-112 | Speed Guide Bar (Lower) |
| 113 | PR-113 | Speed Shift Arm & Shaft Ass'y. Stop |
| 114 | PR-114 | Mounting Screw (2) (10-32 X 1") |
| 115 | | Washer (Same as PR-26) |
| 116 | | Shaft (Same as PR-27) |
| 117 | PR-117 | Nylon Bumper Rear |




AMP CHASSIS - CAPACITOR & MISC IDENT.




AMP CHASSIS - RESISTOR & INDUCTOR IDENT.




EQUALIZATION SW (M8) SHOWN IN "7 1/2" POSITION
SW SEQUENCE
1 - 3 3/4
2 - 7 1/2
3 - 15

RECORD-PLAY SW (M11) SHOWN IN "PLAY" POSITION

TRANSPORT SELECTOR SW (M10) SHOWN IN "REWIND" POSITION
SW SEQUENCE.
1 - REWIND
2 - STOP
3 - THREAD-IDLE
4 - PLAY-RECORD
5 - STOP
6 - FORWARD

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | ECC83 (2AX7) | †385K | 820K | 2200Ω | 56K | 36K | †385K | 1MF | 2200Ω | 56K |
| V2 | ECC83 (2AX7) | †285K | 150K | 2200Ω | 56K | 56K | †285K | 820K | 2200Ω | 56K |
| V3 | ECC81 (2AT7) | †5000Ω | †285K | 33K | 56K | 56K | †5000Ω | †285K | 39K | 56K |
| V4 | ECC81 (2AT7) | †275K | 1.1meg | 3900Ω | 56K | 56K | †5000Ω | †275K | 22K | 56K |
| V5 | 6V6GT | TP | 56K | †860Ω | 140K | 100K | TP | 56K | 0Ω | |
| V6 | 5Y3GT | NC | ¶ | NC | 130Ω | NC | 140Ω | NC | ¶ | |

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 2 OF V6
¶ MEASURED IN "RECORD" POSITION
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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CROWN MODEL
Prince

# ELECT. PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | Preamplifier | ECC83/12AX7 |
| V2 | AF Amplifier | ECC83/12AX7 |
| V3 | Meter Amp. -Cath. Foll. | ECC81/12AT7 |
| V4 | Record Amp. -Cath. Foll. | ECC81/12AT7 |
| V5 | Bias Oscillator | 6V6GT |
| V6 | Rectifier | 5Y3GT |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | CROWN PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 20 | 450 | | PRS450V20 | BR2045 | TC75 | TD-20-450 | TVA-1709 | |
| C2A | 10 | 475 | | AFH4-19-40 | D0179.7 | FP475.5 | TMT-147 | TVL-4838 | |
| B | ▲40 | 475 | | | | | TD-10-500 | | |
| C | ■10 | 475 | | | | | | | |
| D | ▲10 | 475 | | | | | | | |
| C3 | 500 | 6 | | PRS6V500 | BR500-6 | TC605 | TD-500-6 | TVA-1103 | |
| C4 | 25 | 25 | | PRS25V25 | BBR25-25 | TC26 | TD-25-25 | TVA-1205 | |
| C5 | 500 | 6 | | PRS6V500 | BR500-6 | TC605 | TD-500-6 | TVA-1103 | |
| C6 | 500 | 6 | | PRS6V500 | BR500-6 | TC605 | TD-500-6 | TVA-1103 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | CROWN PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C7 | .01 | 400 | | | P488N-01 | D6-103 | CUB4S1 | GEM-411 | 4TM-S1 | |
| C8 | .01 | 400 | | | P488N-01 | D6-103 | CUB4S1 | GEM-411 | 4TM-S1 | |
| C9 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C10 | .05 | 400 | | | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |
| C11 | .01 | 400 | | | P488N-01 | D6-103 | CUB4S1 | GEM-411 | 4TM-S1 | |
| C12 | .2 | 200 | | | P288N-22 | | CUB2P22 | GEM-402 | 2TM-P2 | |
| C13 | 22 | | 5% | | 1469-000022 | | 22R5Q22 | | MS-422 | |
| C14 | .5 | 200 | | | P288N-5 | | CUB2P5 | GEM-205 | 2TM-P5 | |
| C15 | .05 | 400 | | | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |
| C16 | .01 | 400 | | | P488N-01 | D6-103 | CUB4S1 | GEM-411 | 4TM-S1 | |
| C17 | .5 | 200 | | | P288N-5 | | CUB2P5 | GEM-205 | 2TM-P5 | |
| C18 | .001 | 600 | | | P688N-001 | D6-102 | CUB6D1 | GEM-621 | 6TM-D1 | |
| C19 | 33 | | 5% | | 1469-000033 | | 22R5Q33 | | MS-433 | |
| C20 | 33 | | 5% | | 1469-000033 | | 22R5Q33 | | MS-433 | |
| C21 | 1000 | | | | 1464-001 | | 1W5D1 | MC255 | 1FM-21 | |
| C22 | .05 | 400 | | | P488N-05 | | CUB4S5 | GEM-415 | 4TM-S5 | |
| C23 | 1000 | | | | 1464-001 | DD-102 | 1W5D1 | MC255 | 1FM-21 | |
| C24 | 56 | | 5% | | 1469-000056 | | 22R5Q56 | | MS-456 | |
| C25 | | | | | | | | | | |

## CAPACITORS (cont)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | CROWN PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C26 | | | | | | | | | | |
| C27 | | | | | | | | | | |
| C28 | 470 | | 5% | | 1469-00047 | | 5R5T47 | | MS-347 | |
| C29 | | | | | | | | | | |
| C30 | 1000 | | | | 1464-001 | | 1R5D1 | MCB255 | MS-21 | |
| C31 | | | | | | | | | | |
| C32 | | | | | | | | | | |
| C33 | | | | | | | | | | |
| C34 | 10 | 600 | | | | | | | | |
| C35 | 10 | 600 | | | | | | | | |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | CROWN PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 200K | ½ | DF2348 | B-51 | A47-250K-Z | Q13-130 | U45 | Phono Gain, |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | |
| R2A | 1meg | ½ | BH4514 | B-69 | A47-1meg-S | Q11-137 | U54 | Mike Gain |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R3A | 50K | ½ | BH4518 | B-31 | A47-50K-S | Q11-123 | U35 | Meter Adj. |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R4 | 15K | ½ | DW5313 | | | | | Equalization |
| R5 | 15K | ½ | DW5313 | | | | | Equalization |
| R6 | 15K | ½ | DW5313 | | | | | Equalization |
| R7 | 500Ω | 2WW | | | | | | Hum Balance |
| R8 | 500Ω | 2WW | | | | | | Hum Balance |
| R9 | 500Ω | 2WW | | | | | | Hum Balance |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | CROWN PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R10 | 270K | | | |
| R11 | 2200Ω | | | |
| R12 | 820K | | | |
| R13 | 820K | | | |
| R14 | 270K | 2 | | |
| R15 | 2200Ω | 2 | | |
| R16 | 820K | | | |
| R17 | 270K | | | |
| R18 | 270K | | | |
| R19 | 270K | 2 | | |

| ITEM No. | RATING | | CROWN PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R20 | 2200Ω | 2 | | |
| R21 | 820K | | | |
| R22 | 270K | 2 | | |
| R23 | 2200Ω | 2 | | |
| R24 | 39K | 2 | | |
| R25 | 470Ω | 2 | | |
| R26 | 2200Ω | | | |
| R27 | 2200Ω | | | |
| R28 | 270K | | | |
| R29 | 820K | | | |

# ELECT. PARTS LIST AND DESCRIPTIONS (Con't)

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | CROWN PART No. | NOTES |
|---|---|---|---|---|
| R30 | 270K | | | |
| R31 | 820Ω | 1 | | |
| R32 | 56K | | | |
| R33 | 3900Ω | | | |
| R34 | 270K | | | |
| R35 | 22K | 1 | | |
| R36 | 270K | | | |
| R37 | 100K | 2 | | |
| R38 | 56K | | | |

| ITEM No. | RATING OHMS | RATING WATT | CROWN PART No. | NOTES |
|---|---|---|---|---|
| R39 | 39K | 2 | | |
| R40 | 180K | 2 | | |
| R41 | 75Ω | 10 | | |
| R42 | 10Ω | 10 | | |
| R43 | 10Ω | 10 | | |
| R44 | 5000Ω | 10 | | |
| R45 | 10K | 2 | | |
| R46 | 100K | 2 | | |
| R47 | 33K | 1 | | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA CROWN PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| L1 | Bias Osc. Coil | | | | | | |
| L2 | Equalizer Coil | | | | | | |
| L3 | Tone Choke | | | | | | 100 Millihenries |

## FILTER CHOKE

| ITEM No. | RATINGS CURRENT (Measured) | DC RES. | INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA CROWN PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| L4 | .015A | 830Ω | 19HY | T1381A-1 | | C-2985① | | C-1515① | | C-1X① |

① Drill new mounting hole

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | SEC. 1 | SEC. 2 | REPLACEMENT DATA CROWN PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V@ .46A Tap@ 80V Not Used | 600 VCT @.040A | 32V@ 2.8A | 200P2A | | | | | | |
| | | SEC. 3 | SEC. 4 | | | | | | | |
| | | 5V@ 2A | 6.3V@ 1.8A | | | | | | | |

## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA CROWN PART No. | FEDERAL PART No. | GENERAL ELECTRIC PART No. | INTERNATIONAL PART No. | SARKES TARZIAN PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | 2.85A | ① | | | C1B ① | | ① Selenium Type |
| M2 | | ② | | | | | ② Copper Oxide Type |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA CROWN PART No. FUSE | CROWN PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M3 | 3AG | 3A 250V | | | 312003. (3AG 3A 250V) | 342001 | AGC3 | HKP |

## MISCELLANEOUS

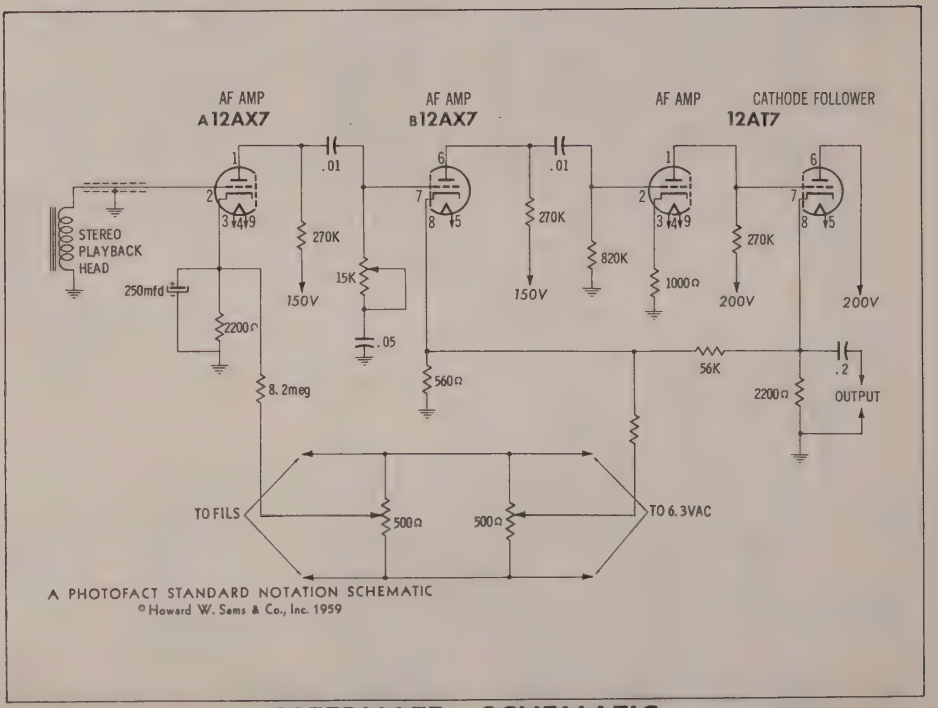
| ITEM No. | PART NAME | CROWN PART No. | NOTES |
|---|---|---|---|
| M4 | Head | | Record |
| M5 | Head | | Erase |
| M6 | Lamp | | #47 |

## MISCELLANEOUS (cont)

| ITEM No. | PART NAME | CROWN PART No. | NOTES |
|---|---|---|---|
| M7 | Lamp | | #47 |
| M8 | Lamp | | #47 |
| M9 | Switch | | Equalization (Rotary Wafer Type) |
| M10 | Switch | | Transport Selector (Rotary Wafer Type) |
| M11 | Switch | | Play-Record (Rotary Wafer Type) |
| M12 | Meter | | VU |
| M13 | Switch | | Record Lock |
| M14 | Motor | | Drive |
| M15 | Motor | | Takeup |
| M16 | Motor | | Rewind |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)




A PHOTOFACT STANDARD NOTATION SCHEMATIC

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## ALTERNATE SCHEMATIC

PHOTOFACT* Folder with CIRCUITRACE*

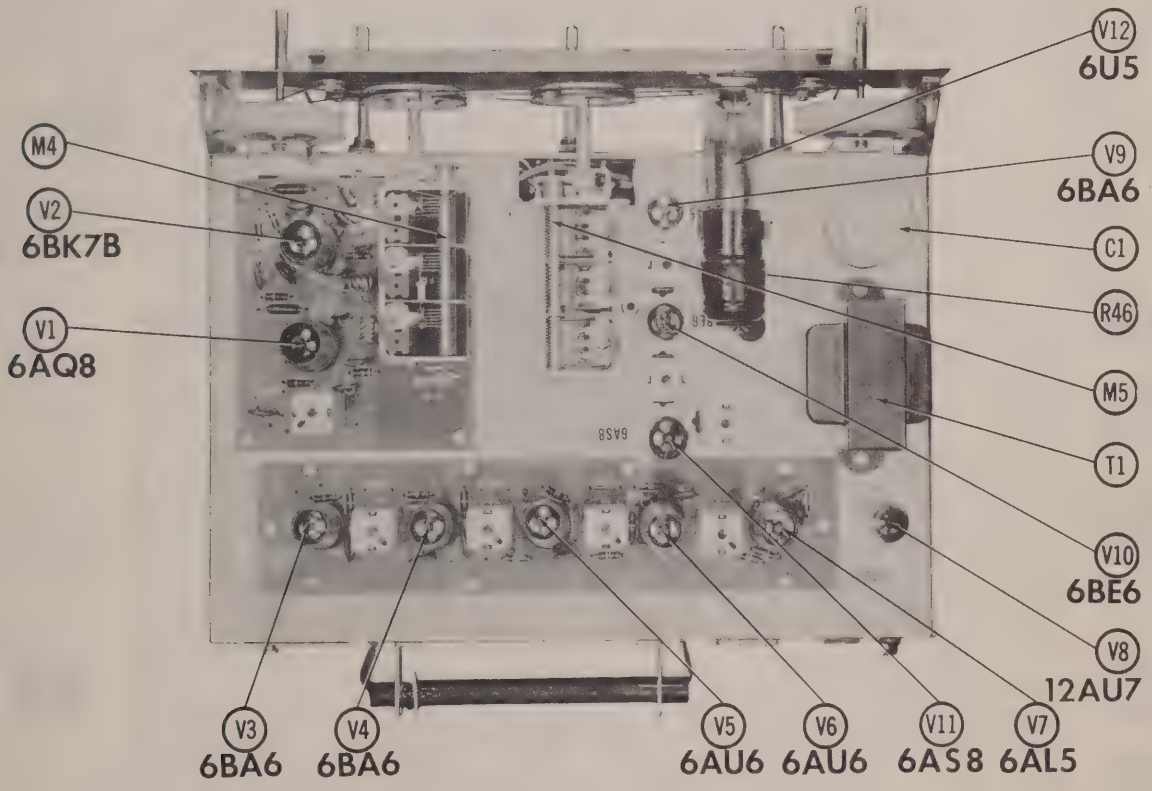
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# LAFAYETTE
# MODELS KT-500, LT-50

LAFAYETTE
MODELS KT-500, LT-50

MODEL LT-50

| | | | |
|---|---|---|---|
| TRADE NAME | Lafayette Model LT-50 (Model KT-500 is Kit Form) | | |
| SUPPLIER | Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y. | | |
| TYPE SET | AC Operated 12 Tube FM-AM Tuner | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles | RATING | 51 Watts, .54 Amp. @ 117 Volts AC |
| TUNING RANGE | BROADCAST 540 - 1620KC | FREQ. MOD. | 88 - 108MC |




LAFAYETTE
MODELS KT-500, LT-50

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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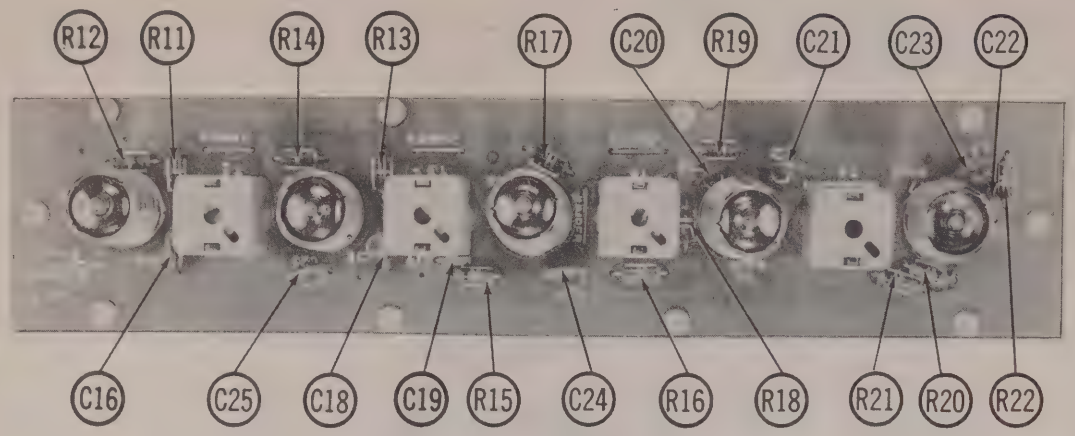
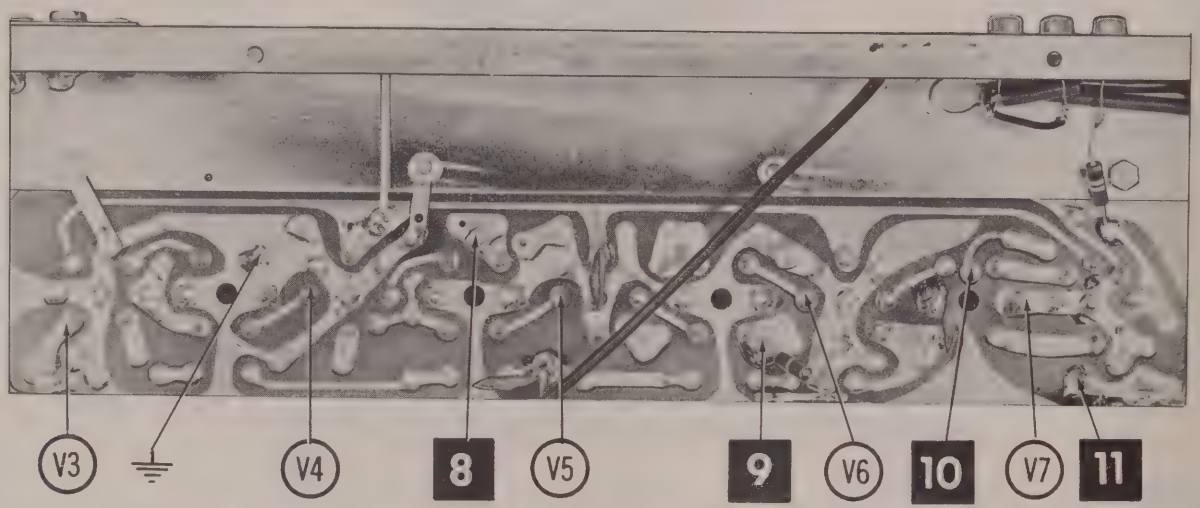
SET 445 FOLDER 4



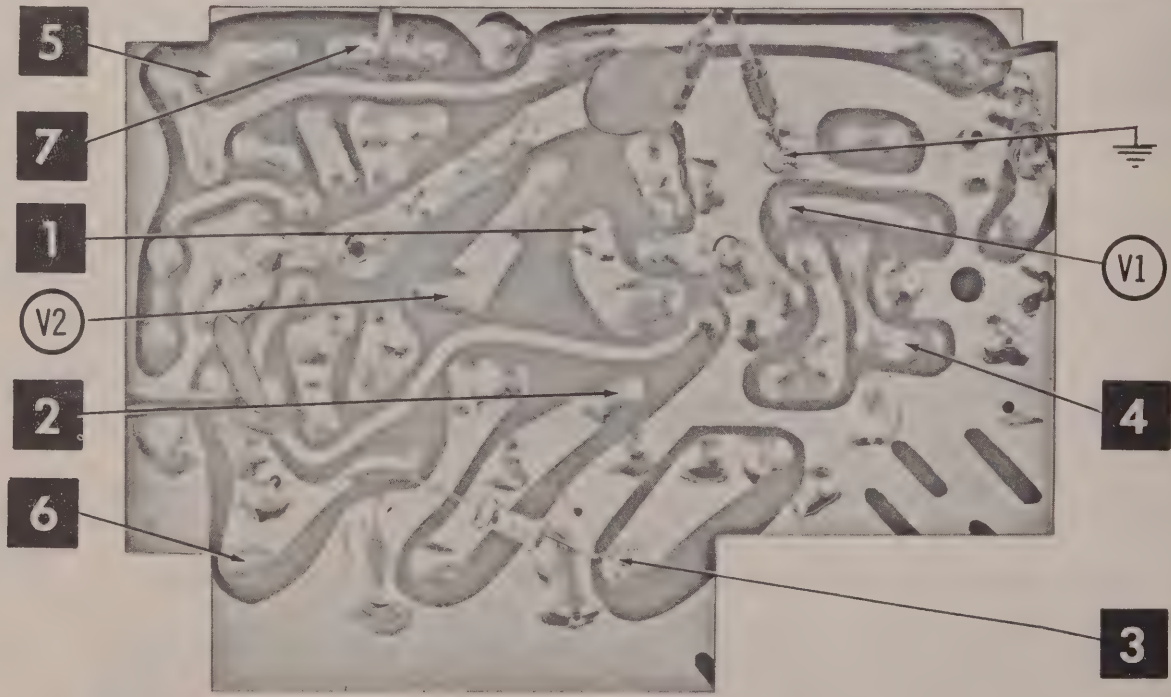

FM IF PRINTED BOARD




A Howard W. Sams CIRCUITRACE* Photo

FM IF PRINTED BOARD

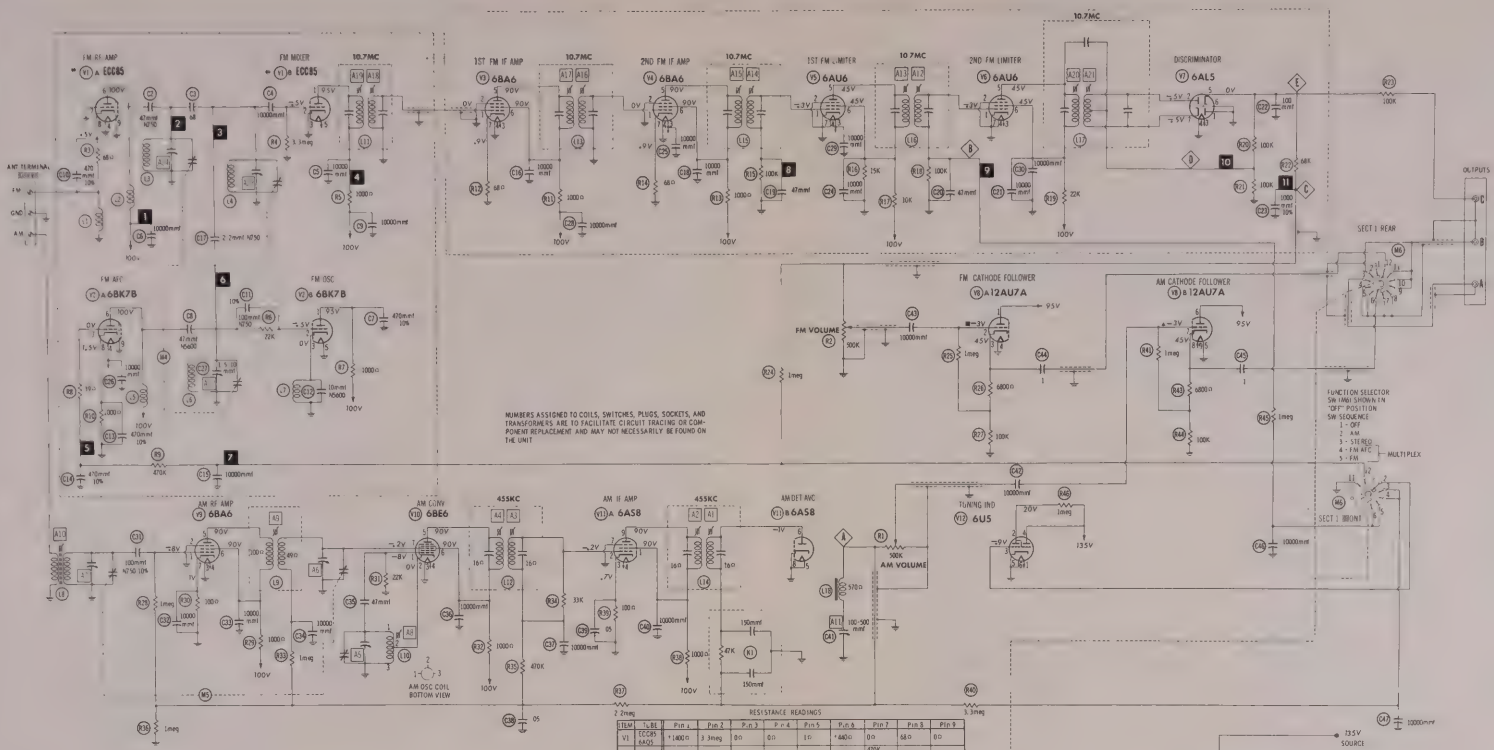
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED




A Howard W. Sams CIRCUITRACE* Photo

FM RF PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | EC(B5 6AQ5 | *1400Ω | 3.3meg | 0Ω | 0Ω | 1Ω | *440Ω | 0Ω | 68Ω | 0Ω |
| V2 | 6BK7B | *1400Ω | 22K | 1Ω | 1Ω | 0Ω | *440Ω | 470K ●0.6meg | 1000Ω | 0Ω |
| V3 | 6BA6 | 6Ω | 0Ω | 1Ω | 0Ω | *1400Ω | *1400Ω | 68Ω | | |
| V4 | 6BA6 | 6Ω | 0Ω | 1Ω | 0Ω | *1400Ω | *1400Ω | 68Ω | | |
| V5 | 6AU6 | 100K | 0Ω | 1Ω | 0Ω | *10K | *10K | 0Ω | | |
| V6 | 6AU6 | 100K | 0Ω | 1Ω | 0Ω | *22K | *22K | 0Ω | | |
| V7 | 6AL5 | 0Ω | 100K | 1Ω | 0Ω | 150K | 0Ω | 100K | | |
| V8 | 12AU7A | *1500Ω | 1.1meg | 100K | 0Ω | 0Ω | *1500Ω | 1.1meg | 100K | 1Ω |
| V9 | 6BA6 | 1.6meg | 0Ω | 0Ω | 1Ω | *1400Ω | *1400Ω | 100Ω | | |
| V10 | 6BE6 | 22K | 5Ω | 0Ω | 1Ω | *1400Ω | *1400Ω | 1.6meg | | |
| V11 | 6AS8 | *1400Ω | 1.6meg | 100Ω | 1Ω | 0Ω | 450K | 0Ω | 0Ω | *1400Ω |
| V12 | 6U5 | 1Ω | *1meg | 1.1meg | *0Ω | 0Ω | 0Ω | | | |

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
* MEASURED FROM OUTPUT OF ANT.
+ MEASURED FROM PIN 3 OF V8.
▲ MEASURED FROM PIN 8 OF V8.
● MEASURED IN "FM-AFC" POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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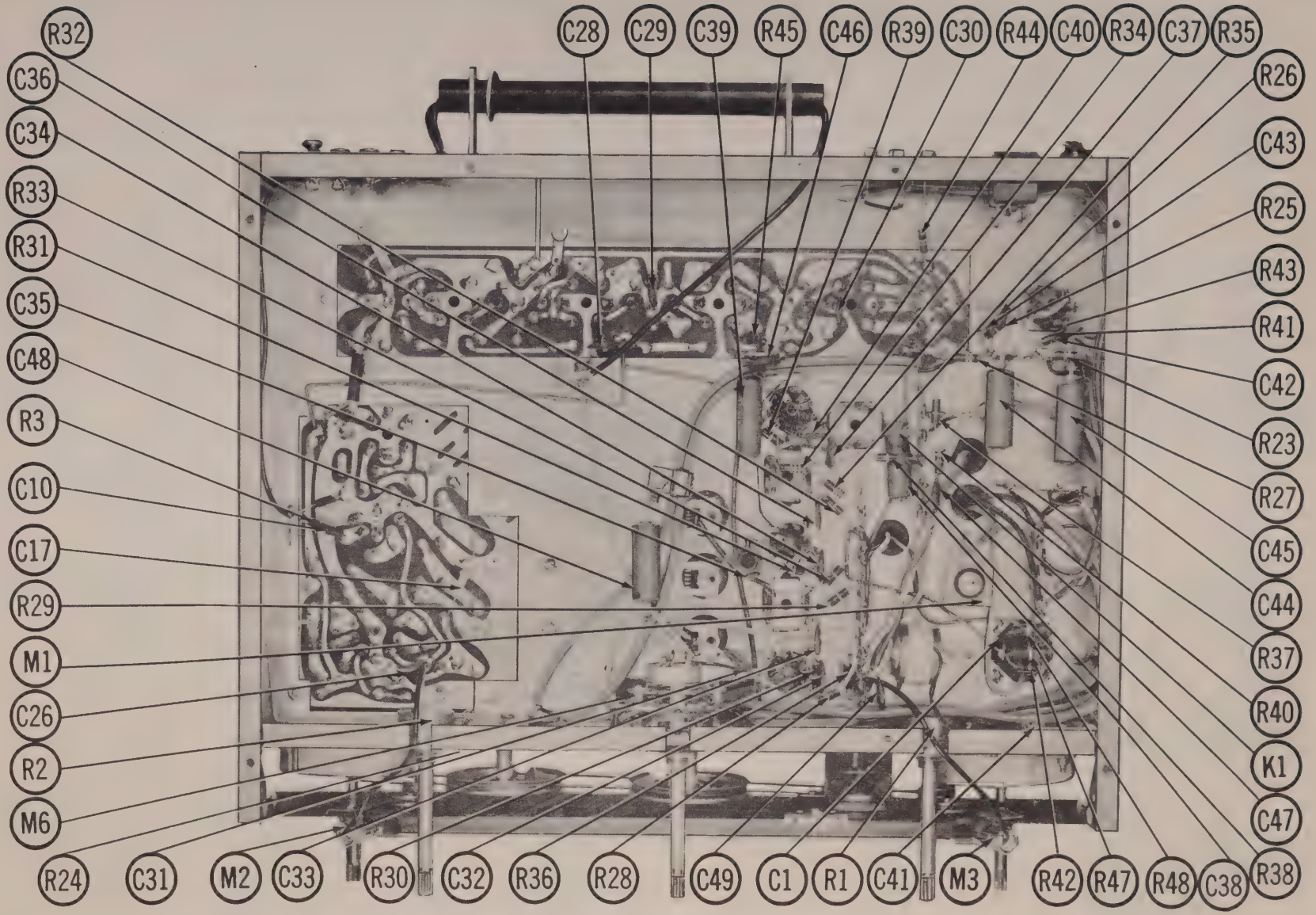
**LAFAYETTE**
**MODELS KT-500, LT-50**




CHASSIS BOTTOM VIEW - CAPACITOR, RESISTOR & MISC. IDENT.

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4, A12 thru A21..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A7, A9, A22, A23, A24..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A8..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .1mfd | High side to pin 7 (grid) of 6BE6 (V10). Low side to chassis. | 455KC (Unmod.) | AM | Point of non-interference | DC probe to point Ⓐ. Common to chassis. | A1, A2, A3, A4 | Adjust for maximum deflection. |
| 2. | | Loop | 1600KC | " | 1600KC | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 1400KC | " | Tune to 1400KC signal | " | A6, A7 | " |
| 4. | | " | 600KC | " | Tune to 600KC signal | " | A8, A9, A10 | Adjust for maximum deflection. (A10 is slide ring on L4). Repeat steps 2, 3 and 4. |
| | 10KC WHISTLE FILTER ADJUSTMENT | | | | | | | |
| 5. | .1mfd | High side to point Ⓐ. Low side to chassis. | 10KC | AM | | AC probe to output jack Ⓑ. Common to chassis. | A11 | Adjust for MINIMUM deflection. |

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set Function to "FM" Position (No AFC).

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | .1mfd | High side to pin 2 (grid) of ECC85/6AQ8 (V1). Low side to chassis. | 10.7MC (Unmod.) | FM | Point of non-interference | DC probe to point Ⓑ. Common to chassis. | A12, A13, A14, A15, A16, A17, A18, A19 | Adjust for maximum deflection. |
| 7. | " | " | " | " | " | DC probe thru 1meg to point Ⓓ. Common to chassis. | A20 | " |
| 8. | " | " | " | " | " | DC probe to point Ⓒ. Common to chassis. | A21 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | .1mfd | High side to pin 2 (grid) of ECC85/6AQ8 (V1). Low side to chassis. | 10.7MC (450KC Swp.) | FM | Point of non-interference | Vert. Amp. thru 100K to point Ⓑ. Low side to chassis. | A12, A13, A14, A15, A16, A17, A18, A19 | Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. |
| 7. | " | " | " | " | " | Vert. Amp. thru 100K to point Ⓓ. Low side to chassis. | A20 | " |
| 8. | " | " | " | " | " | Vert. Amp. thru 100K to point Ⓒ. Low side to chassis. | A21 (Top) | Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A20 for maximum amplitude and straightness of crossover lines. |

FM RF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | 270Ω Carbon Resistor | Across FM antenna terminals. | 108MC (Unmod.) | FM | 108MC | DC probe thru 100K to point Ⓑ. Common to chassis. | A22 | Adjust for maximum deflection. |
| 10. | " | " | 106MC | " | Tune to 106MC signal | " | A23, A24 | " |
| 11. | " | " | 88MC | " | 88MC | " | L6, L4, L3 | Adjust for maximum deflection. Repeat Steps 9, 10, & 11. |

FIG. 1

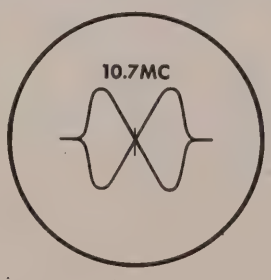
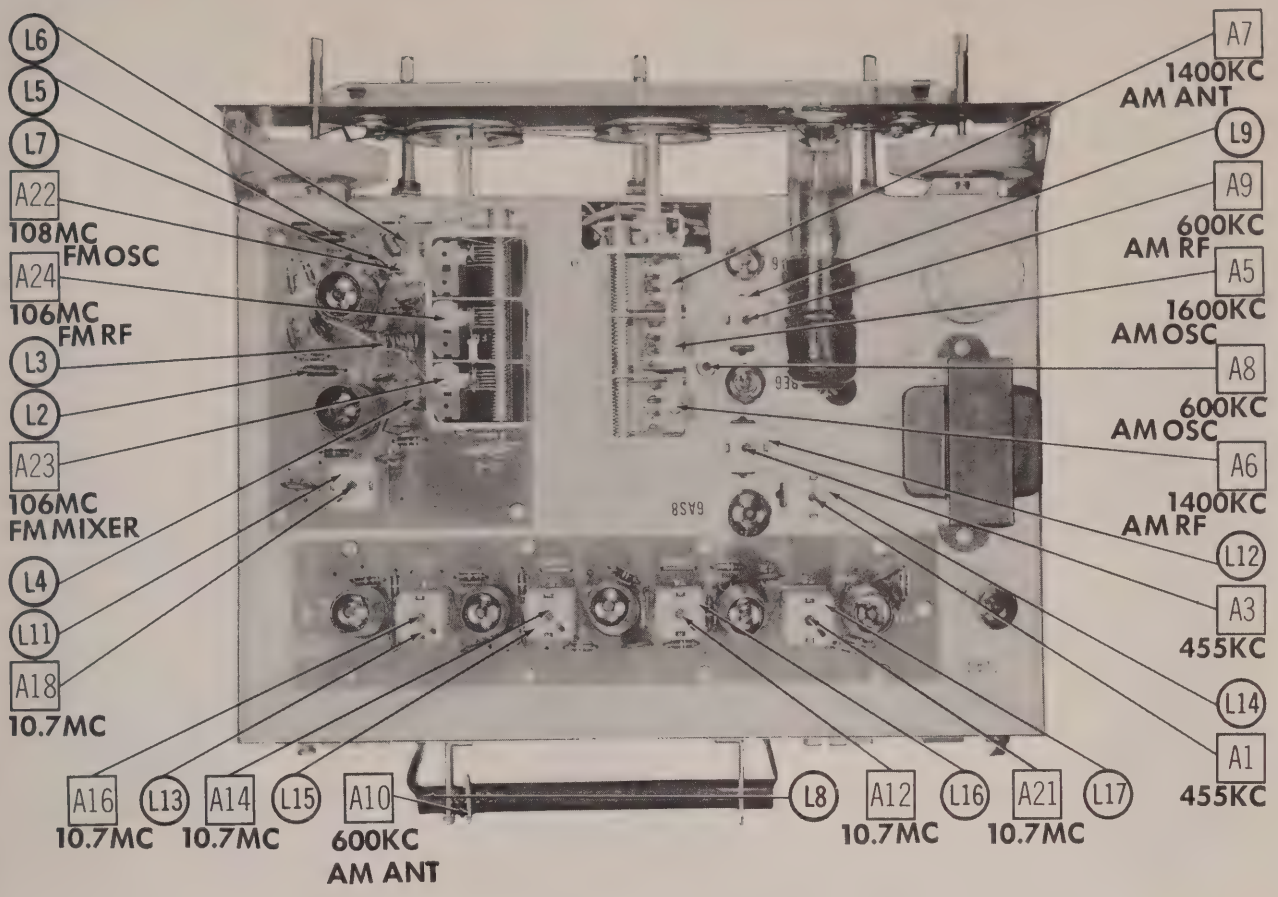
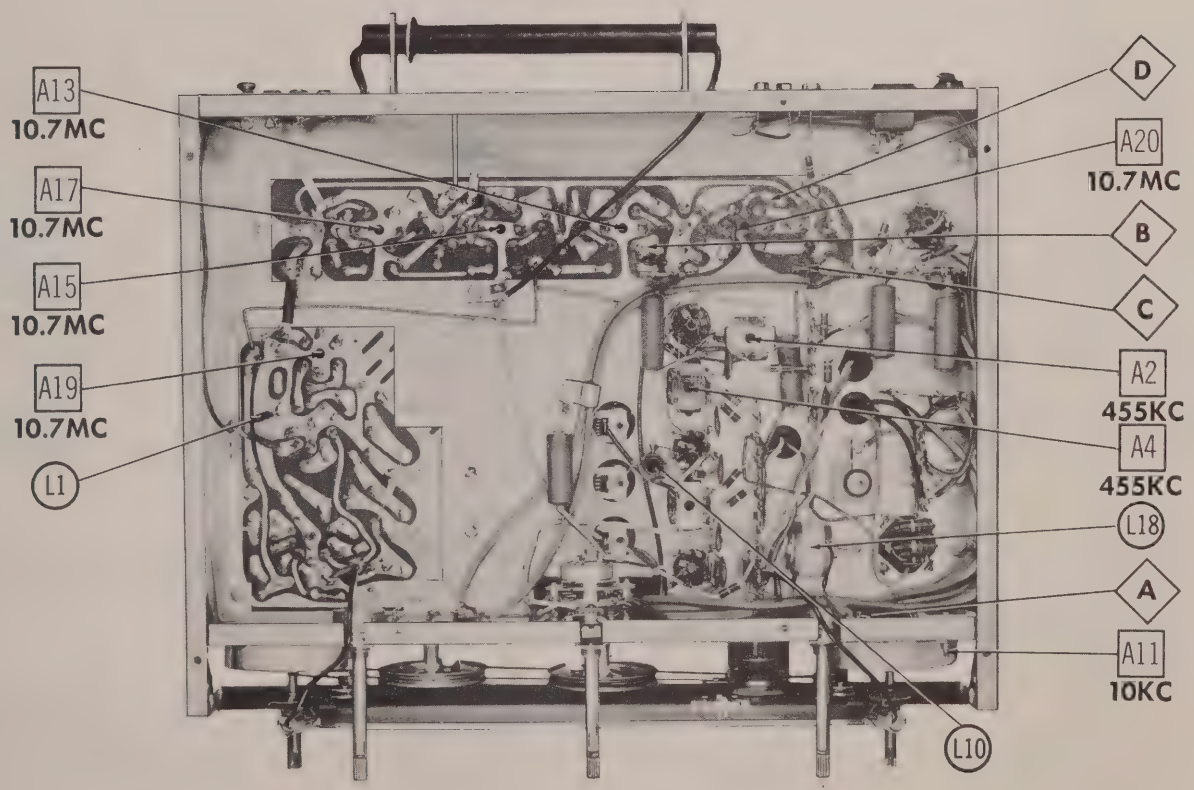


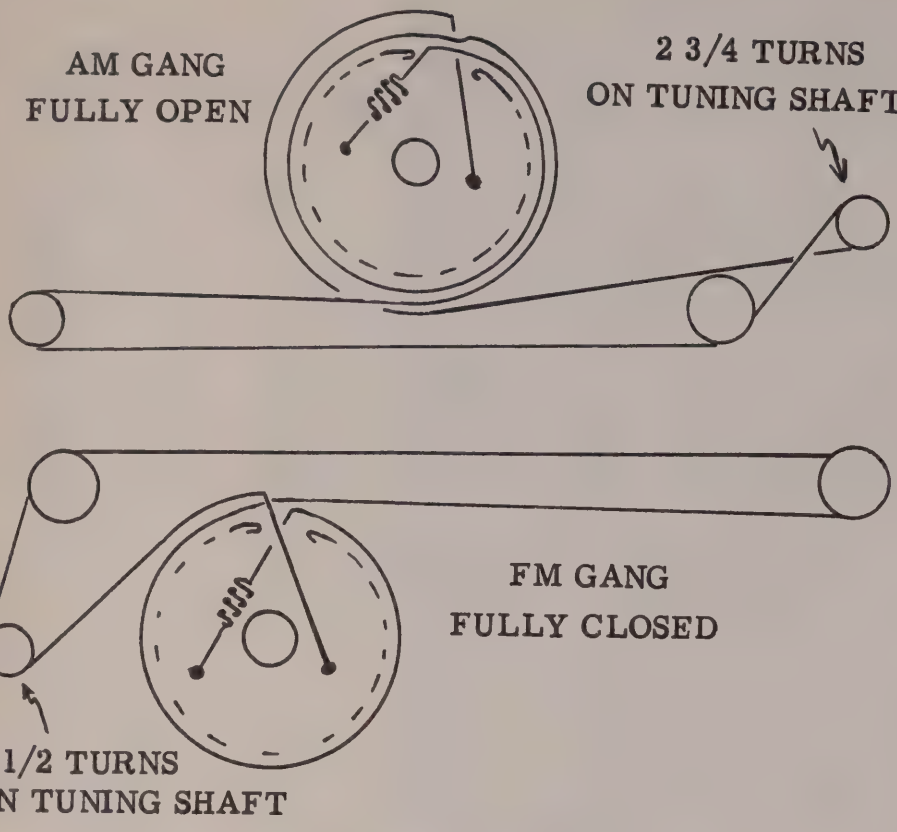
FIG. 2



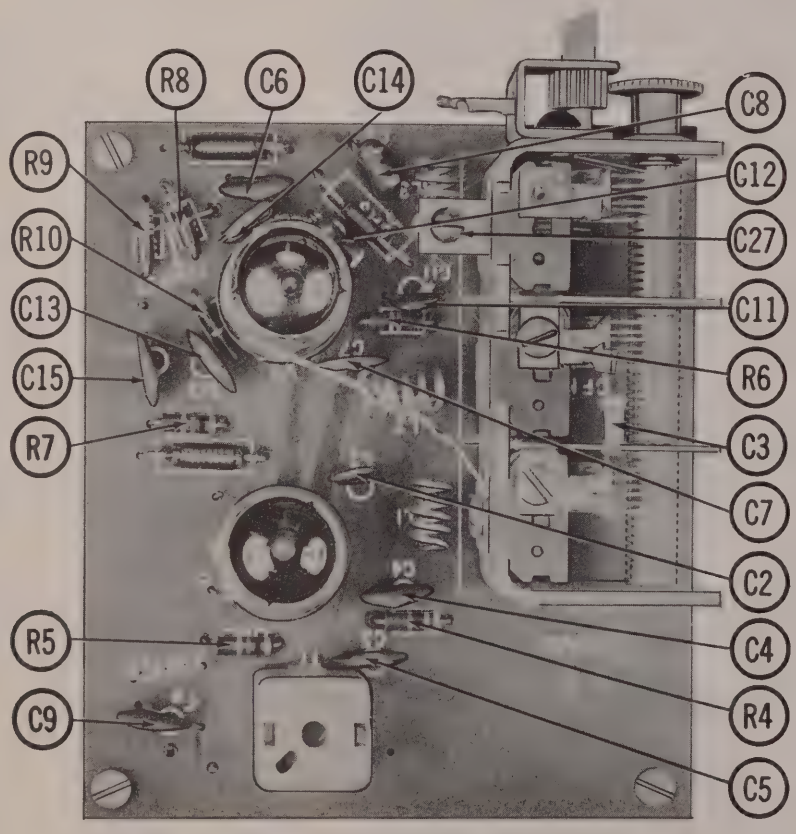

CHASSIS TOP VIEW - ALIGN. & INDUCTOR IDENT.




CHASSIS BOTTOM VIEW - ALIGN. & INDUCTOR IDENT.




DIAL CORD STRINGING




FM RF PRINTED BOARD

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | FM RF Amp. - FM Mixer | ECC85/6AQ5 | |
| V2 | FM Osc. - FM AFC | 6BK7B | |
| V3 | 1st FM IF Amplifier | 6BA6 | |
| V4 | 2nd FM IF Amplifier | 6BA6 | |
| V5 | 1st Limiter | 6AU6 | |
| V6 | 2nd Limiter | 6AU6 | |
| V7 | Discriminator | 6AL5 | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V8 | FM Cath. Follower - AM Cath. Follower | 12AU7A | |
| V9 | AM RF Amplifier | 6BA6 | |
| V10 | AM Converter | 6BE6 | |
| V11 | AM IF Amplifier - AM Det. - AVC | 6AS8 | |
| V12 | Tuning Indicator | 6U5 | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | LAFAYETTE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | ▲60 | 150 | 12-26 | | C0110 | | | TVLS-4443.6* | |
| B | ■60 | 150 | | | BR6015 | | | | |
| C | 20 | 150 | | | | | | | |
| D | ▲40 | 150 | | | | | | | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | LAFAYETTE PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C2 | 47 | | N750 | 12-33 | N750-DI 47 | DTN-47 | C10Q47U | CN7-447 | 5TCU-Q47 | |
| C3 | .68 | | | 12-23 | NPO-SI .68 | TCZ-R68 | | | | |
| C4 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C5 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C6 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C7 | 470 | | 10% | 12-22 | DI-470 | D6-471 | L10T47 | JL-347 | 5GA-T47S 10% * | |
| C8 | 47 | | N5600 | 12-35 | | | | | | |
| C9 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C10 | 470 | | 10% | 12-22 | DI-470 | D6-471 | L10T47 | JL-347 | 5GA-T47S 10% * | |
| C11 | 100 | | N750 10% | 12-34 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1 | |
| C12 | 10 | | N5600 | 12-24 | | | | | | |
| C13 | 470 | | 10% | 12-22 | DI-470 | D6-471 | L10T47 | JL-347 | 5GA-T47S 10% * | |
| C14 | 470 | | 10% | 12-22 | DI-470 | D6-471 | L10T47 | JL-347 | 5GA-T47S 10% * | |
| C15 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |

## CAPACITORS (cont)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | LAFAYETTE PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C16 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C17 | 2.2 | | N750 | 12-25 | | TCN-2R2 | | CN7-522 | | |
| C18 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C19 | 47 | | | 12-19 | BPD-000047 | DD-470 | L10Q47 | CNO-447 | 5GA-Q47 | |
| C20 | 47 | | | 12-19 | BPD-000047 | DD-470 | L10Q47 | CNO-447 | 5GA-Q47 | |
| C21 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C22 | 100 | | | 12-3 | BPD-0001 | DD-101 | L10T1 | UC-310 | 5GA-T1 | |
| C23 | 1000 | | 10% | 12-2 | DI-1000 | D6-102 | L10D1 | JL-210 | 5GA-D1S 10% * | |
| C24 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C25 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C26 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C27 | 1.5-10 | | | 12-27 | | 829-10 | | | | |
| C28 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C29 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C30 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C31 | 100 | | N750 10% | 12-3 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1S 10% * | |
| C32 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C33 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C34 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C35 | 47 | | | 12-19 | BPD-000047 | DD-470 | L10Q47 | CNO-447 | 5GA-Q47 | |
| C36 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C37 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C38 | .05 | 200 | | 12-6 | P288N-05 | DF-503 | CUB4S5 | GEM-215 | 4TM-S5 | |
| C39 | .05 | 200 | | 12-6 | P288N-05 | DF-503 | CYB4S5 | GEM-215 | 4TM-S5 | |
| C40 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C41 | 100-500 | | | 12-28 | | | | | | |
| C42 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C43 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C44 | .1 | 200 | | 12-9 | P288N-1 | DF-104 | CUB2P1 | GEM-201 | 2TM-P1 | |
| C45 | .1 | 200 | | 12-9 | P288N-1 | DF-104 | CUB2P1 | GEM-201 | 2TM-P1 | |
| C46 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C47 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C48 | .05 | 400 | | 12-11 | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |
| C49 | 10000 | | | 12-8 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | LAFAYETTE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 500K | ½ | 11-9 | B-59 | A47-500K-S | Q11-133 | U48 | AM Volume |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R2A | 500K | ½ | 11-9 | B-59 | A47-500K-S | Q11-133 | U48 | FM Volume |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |

# PARTS LIST AND DESCRIPTIONS (Con't)

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | LAFAYETTE PART No. | NOTES |
|---|---|---|---|---|
| R3 | 68Ω | | 13-40 | |
| R4 | 3.3meg | | 13-41 | |
| R5 | 1000Ω | | 13-42 | |
| R6 | 22K | | 13-43 | |
| R7 | 1000Ω | | 13-42 | |
| R8 | 39Ω | | 13-55 | |
| R9 | 470K | | 13-45 | |
| R10 | 1000Ω | | 13-42 | |
| R11 | 1000Ω | | 13-42 | |
| R12 | 68Ω | | 13-40 | |
| R13 | 1000Ω | | 13-42 | |
| R14 | 68Ω | | 13-40 | |
| R15 | 100K | | 13-46 | |
| R16 | 15K | | 13-47 | |
| R17 | 10K | | 13-48 | |
| R18 | 100K | | 13-46 | |
| R19 | 22K | | 13-43 | |
| R20 | 100K | | 13-46 | |
| R21 | 100K | | 13-46 | |
| R22 | 68K | | 13-54 | |
| R23 | 100K | | 13-46 | |
| R24 | 1meg | | 13-5 | |
| R25 | 1meg | | 13-5 | |
| R26 | 6800Ω | | 13-52 | |
| R27 | 100K | | 13-46 | |
| R28 | 1meg | | 13-5 | |
| R29 | 1000Ω | | 13-42 | |
| R30 | 100Ω | | 13-44 | |
| R31 | 22K | | 13-43 | |
| R32 | 1000Ω | | 13-42 | |
| R33 | 1meg | | 13-5 | |
| R34 | 33K | | 13-50 | |
| R35 | 470K | | 13-45 | |
| R36 | 1meg | | 13-5 | |
| R37 | 2.2meg | | 13-3 | |
| R38 | 1000Ω | | 13-42 | |
| R39 | 100Ω | | 13-44 | |
| R40 | 3.3meg | | 13-41 | |
| R41 | 1meg | | 13-5 | |
| R42 | 4700Ω | | 13-51 | |
| R43 | 6800Ω | | 13-52 | |
| R44 | 100K | | 13-46 | |
| R45 | 1meg | | 13-5 | |
| R46 | 1meg | | 13-5 | |
| R47 | 220Ω | 1 | 13-53 | |
| R48 | 220Ω | 1 | 13-53 | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | LAFAYETTE PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | AM Det. RF Filter | 150mmf, 150mmf, 47K | 16-7 | Aerovox PA-98<br>Centralab PC-51<br>Cornell-Dubilier 111TM2<br>Sprague D2 |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA LAFAYETTE PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| L1 | FM Ant. Coil | 23-5 | 19-1000 | BC-561 | 4602 | | |
| L2 | RF Choke | 23-6 | | | | | 3.3 Microhenries |
| L3 | FM RF Coil | 23-4 | | | | | |
| L4 | FM Mixer Coil | 23-4 | | | | | |
| L5 | RF Choke | 23-6 | | | | | 3.3 Microhenries |
| L6 | FM Osc. Coil | 23-3 | | | | | |
| L7 | Cathode Choke | 23-5 | 19-1000 | BC-561 | 4602 | | 1 Microhenry |
| L8 | Loopstick | 23-1 | | | | | |
| L9 | AM RF Trans. | 24-6 | | | | | |
| L10 | AM Osc. Coil | 23-2 | | BC-393 | | | |
| L11 | 1st FM IF Trans. | 24-1 | 16-3490 | | 1463-PC | | |
| L12 | 1st AM IF Trans. | 24-7 | 16-6758 | BC-352 | 12-C1 | RF-1 | |
| L13 | 2nd FM IF Trans. | 24-2 | 16-3490 | | 1463-PC | | |
| L14 | 2nd AM IF Trans. | 24-8 | 16-6758 | BC-353 | 12-C2 | RF-2 | |
| L15 | 3rd FM IF Trans. | 24-3 | 16-3490 | | 1463-PC | | |
| L16 | Limiter Trans. | 24-4 | 16-3490 | | 1463-PC | | |
| L17 | Discriminator | 24-5 | 17-3491 | | 1464-PC | | |
| L18 | 10KC Filter Coil | 23-7 | | | | | |

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | REPLACEMENT DATA LAFAYETTE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V ② .54A | 130V ② .033A<br>Tap ② 6.3V<br>② 4.4A | 15-5 | | | | | | |

## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA LAFAYETTE PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | SARKES TARZIAN PART No. | NOTES |
|---|---|---|---|---|---|---|
| M1 | .033A | 17-4 ① | 1234AH ① | TO65 ①<br>SD-94 ② | 65A ①<br>K200 ②③ | ① Selenium Type<br>② Silicon Type<br>③ Use 10Ω (Minimum) Resistor in series |

## MISCELLANEOUS

| ITEM No. | PART NAME | LAFAYETTE PART No. | NOTES |
|---|---|---|---|
| M2 | Lamp | | #47 |
| M3 | Lamp | | #47 |
| M4 | Tuning Cap. | 12-20 | FM, 3 Gang |
| M5 | Tuning Cap. | 12-21 | AM, 3 Gang (Ant. 22-520mmf, RF 23-514mmf, Osc. 14-120mmf) |
| M6 | Switch | 14-6 | Function, 5 Position, Rotary Wafer Type; Includes Power On-Off, Rotary Snap Type |
| | Printed Board | 16-5 | FM-IF Strip |
| | Printed Board | 16-6 | FM-RF Strip |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 18-7 | Large, 2 used |
| Knob | 18-8 | Pointer, Large |
| Knob | 18-9 | Small, 2 used |
| Top Cover | 10-19 | |
| Dial Pointer | 20-36 | White |
| Dial Pointer | 20-37 | Yellow |
| Dial Glass | 20-35 | |
| Dial Plate | 10-27 | Includes Pulley Assembly |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# LAFAYETTE
# MODEL PA-61

LAFAYETTE
MODEL PA-61

LAFAYETTE
MODEL PA-61

| | |
|---|---|
| TRADE NAME | Lafayette Model PA-61 |
| SUPPLIER | Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y. |
| TYPE SET | AC Operated 5 Tube Audio Amplifier |
| POWER SUPPLY | 110 -120 Volts AC, 60 Cycles RATING 62 Watts, .64 Amp. @117 Volts AC |

SOME VERSIONS MAY HAVE A MANUAL RECORD PLAYER MOUNTED ON THE TOP OF THE AMPLIFIER CASE

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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H991

DATE 6-59



SET 445 FOLDER 5

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Mic Preamp. -AF Amp. | 12AX7 | |
| V2 | AF Amp. -Phase Inv. | 12AX7 | |
| V3 | Output | 6V6GT | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V4 | Output | 6V6GT | |
| V5 | Rectifier | 6X5GT | ① |

① Some versions may use 6AX5GT in this application.

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Lafayette PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | ◓40 | 400 | | AFH4-117-48 | D0640 | FP429 | TMT-157 | TVLS-4657.6* | |
| B | ■30 | 350 | | | | | TD-40-450 | | |
| C | ▲10 | 300 | | | | | | | |
| D | 20 | 25 | | | | | | | |
| C2 | 10 | 250 | | PRS350V10 | BR1045 | TC52 | TD-10-250 | TVA-1504 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | Lafayette PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C3 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C4 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C5 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C6 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C7 | 470 | | 10% | | DI 470 | MD-471 | | JL-347 | 5GA-T47S 10%* | |
| C8 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C9 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Lafayette PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 500K | ½ | GVC-500K | B-60 | A47-500K-Z | Q13-133 | U48 | Microphone |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R2A | 500K | ½ | GVC-500K | B-60 | A47-500K-Z | Q13-133 | U48 | Phono |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R3A | 2meg | ½ | LFBC2M | B-76 | A47-2meg-Z | Q13-139 | U55 | Bass |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R4A | 500K | ½ | GVC-500K | B-60 | A47-500K-Z | Q13-133 | U48 | Treble |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |

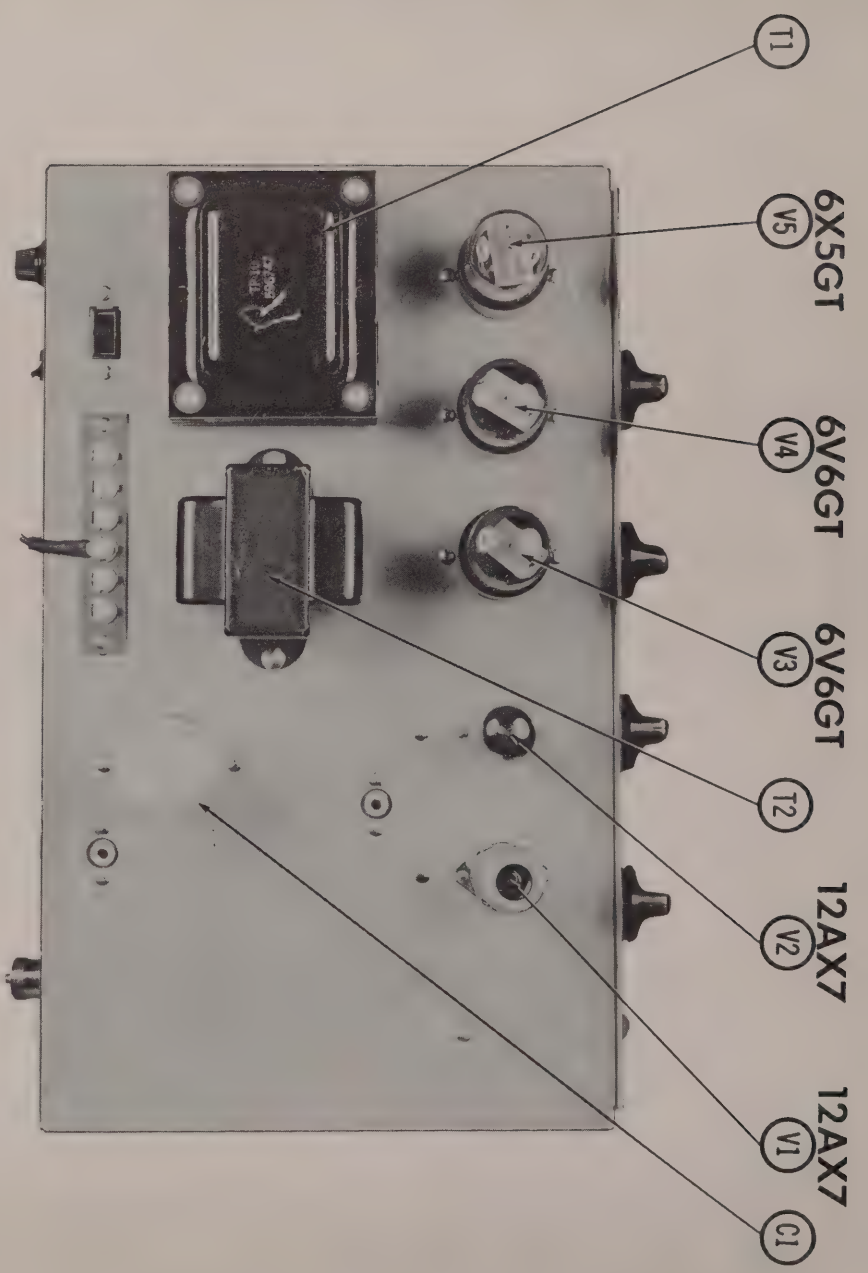
## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | Lafayette PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R5 | 3.3meg | | | |
| R6 | 100K | | | |
| R7 | 220K | | | |
| R8 | 220K | | | |

| ITEM No. | RATING | | Lafayette PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R9 | 100K | | | |
| R10 | 1000Ω | | | |
| R11 | 1meg | | | |
| R12 | 220K | | | |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (cont)

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | Lafayette PART No. | NOTES |
|---|---|---|---|---|
| R13 | 100K | | | |
| R14 | 100K 5% | | | |
| R15 | 1000Ω | | | |
| R16 | 120K | | | |
| R17 | 3900Ω | | | |
| R18 | 120K | | | |
| R19 | 5600Ω | 2 | | |
| R20 | 300Ω | 7 | | |
| R21 | 1000Ω | | | |
| R22 | 22K | | | |

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA Lafayette PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V @ .64A | 680 VCT @ .085A | 6.3 VCT @ 3.3A | TP-10 | 24R04 | P-2952 | | PM8409 | 24R04 | R-11B |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA Lafayette PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 6000Ω CT | 330Ω (70V) Tap @ 16Ω 8Ω, 4Ω | T018A | | | | | | | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA Lafayette PART No. FUSE | Lafayette PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M1 | 3AG | 2A 250V | | | 312002. (3AG 2A 250V) | 342001 | AGC 2 | HKP |

## MISCELLANEOUS

| ITEM No. | PART NAME | Lafayette PART No. | NOTES |
|---|---|---|---|
| M2 | Lamp | | #51 Not used in some versions |
| M3 | Switch | | Power On-Off (Slide Type) |

## CABINETS & CABINET PARTS

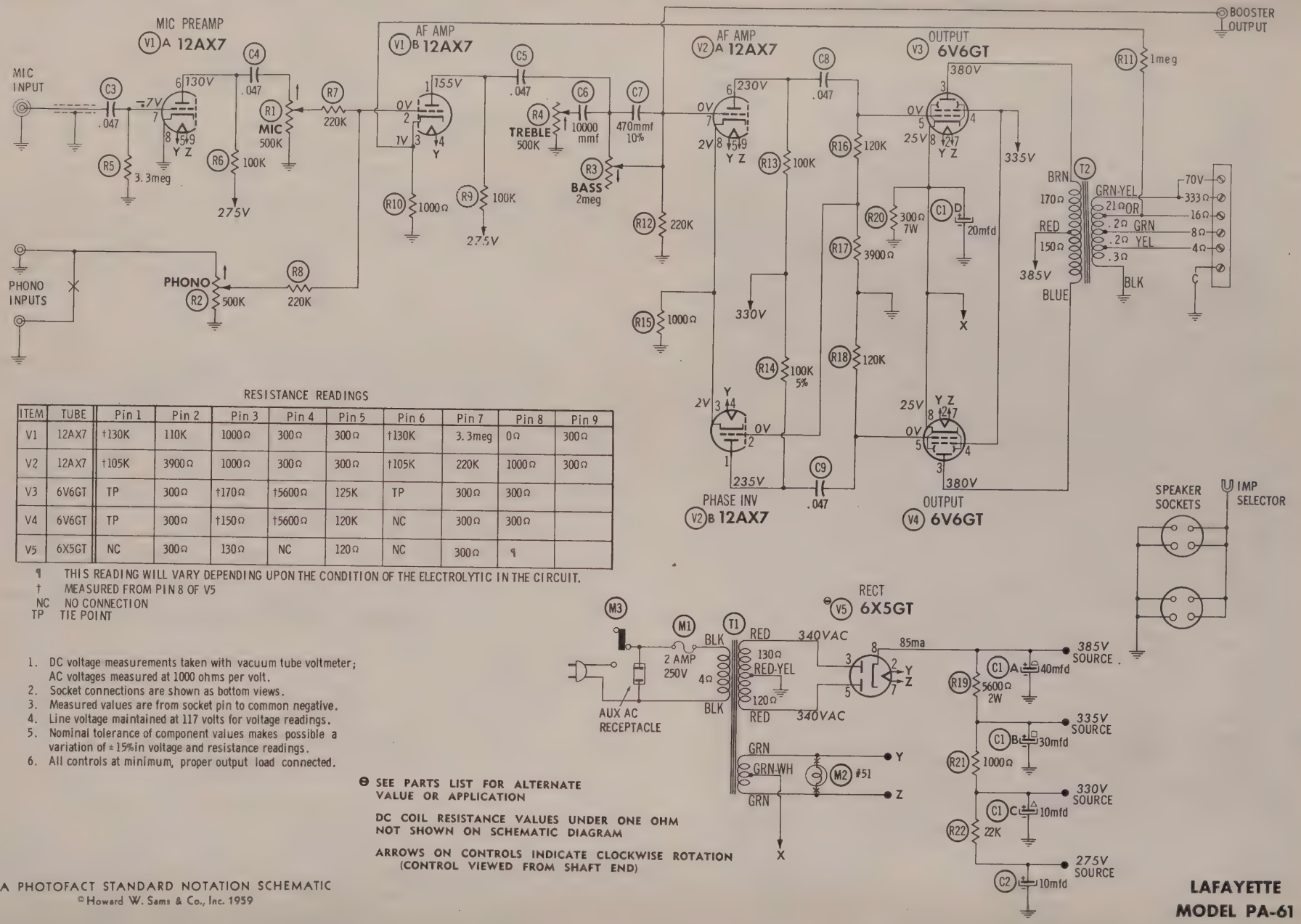
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

# CHASSIS—BOTTOM VIEW




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †130K | 110K | 1000Ω | 300Ω | 300Ω | †130K | 3.3meg | 0Ω | 300Ω |
| V2 | 12AX7 | †105K | 3900Ω | 1000Ω | 300Ω | 300Ω | †105K | 220K | 1000Ω | 300Ω |
| V3 | 6V6GT | TP | 300Ω | †170Ω | †5600Ω | 125K | TP | 300Ω | 300Ω | |
| V4 | 6V6GT | TP | 300Ω | †150Ω | †5600Ω | 120K | NC | 300Ω | 300Ω | |
| V5 | 6X5GT | NC | 300Ω | 130Ω | NC | 120Ω | NC | 300Ω | ¶ | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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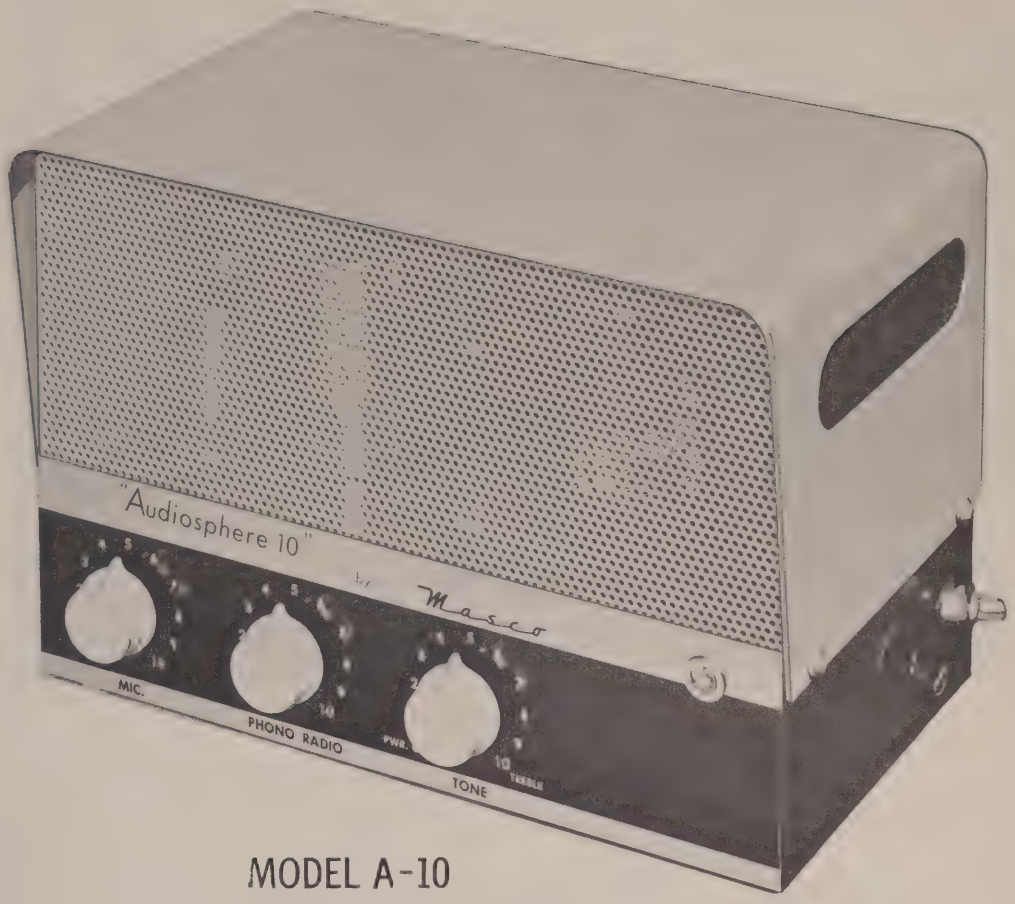
**LAFAYETTE MODEL PA-61**

PHOTOFACT* Folder



MASCO
MODELS A-10, AS-10




MODEL A-10

MASCO
MODELS A-10, AS-10

| | |
|---|---|
| TRADE NAME | Masco Model A-10, AS-10 |
| MANUFACTURER | Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N. Y. |
| TYPE SET | AC Operated 4 Tube, 2 Channel Audio Amplifier |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 62 Watts, .6 Amp. @ 117 Volts AC |

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Mic Preamplifier | 6AT6 | |
| V2 | AF Amplifier | 6AU6 | |
| V3 | Output | 6L6GB | |
| V4 | Rectifier | 5Y3GT | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | MASCO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | ▲20 | 450 | | AFH4-19-10 | D0179.3 | FP474.5 | TMQ-11 | TVL-4832 | |
| B | ■20 | 450 | | | | | TD-10-450 | | |
| C | ▲10 | 450 | | | | | | | |
| D | 10 | 450 | | | | | | | |
| C2 | 10 | 50 | | PRS50V10 | BBR10-50 | TC32 | TD-10-50 | TVA-1304 | |
| C3 | 10 | 50 | | PRS50V10 | BBR10-50 | TC32 | TD-10-50 | TVA-1304 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | MASCO PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C4 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C5 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C6 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C7 | 1000 | | | | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C8 | .02 | 600 | | | P688N-02 | DF-203 | CUB6S2 | GEM-612 | 6TM-S2 | |
| C9 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MASCO PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 500K | ½ | BA811-1958 | B-60 | A47-500K-Z | Q13-133 | U48 | Mic. |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R2A | 500K | ½ | BA811-1958 | B-60 | A47-500K-Z | Q13-133 | U48 | Phono-Radio |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R3A | 500K | ½ | 2491 | B-60 | A47-500K-Z | Q13-133 | U48 | Tone |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | |
| R4A | 50Ω | 2(WW) | 1328 | WW-500 | A43-50 | W11-050 | C50P | Hum Balance |
| B | Shaft | | | Not Req. | FKS-½ | SK-5 | Not Req. | |

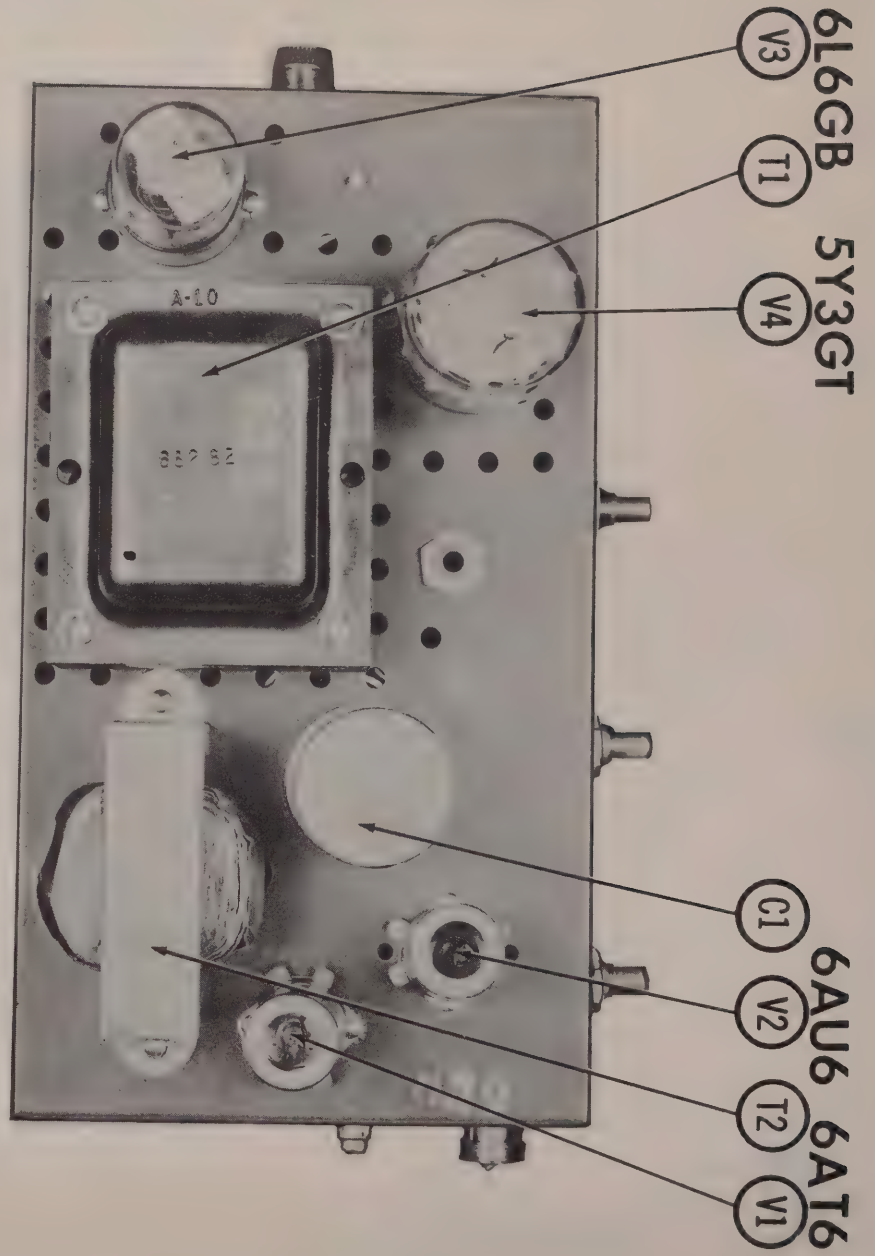
## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | MASCO PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R5 | 1meg | | | |
| R6 | 270K | | | |
| R7 | 270K | | | |
| R8 | 470K | | | |
| R9 | 270K | | | |
| R10 | 1meg | | | |

| ITEM No. | RATING | | MASCO PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R11 | 47K | | | |
| R12 | 1500Ω | | | |
| R13 | 250Ω | 5 | | |
| R14 | 22K | | | |
| R15 | 200Ω | 5 | | |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (cont)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | MASCO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V @ .6A | 680VCT @ .070A | 5V @ 2A | A-10 | 24R02 | P-2952 | | PM8408 | 24R02 | R-11B |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V @ 1.6A | | | | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | MASCO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 5000Ω | 500Ω (70V) Tap @ 8Ω, 4Ω | T-6810 | | | | | | | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | MASCO PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | 3AG | 1A 125V S/B * | | | 313001. (3AG 1A 125V S/B) | 342001 | MDL1 | HKP |

* Some versions may use 2 Amp. regular fuse in this application.

## MISCELLANEOUS

| ITEM No. | PART NAME | MASCO PART No. | NOTES |
|---|---|---|---|
| M2 | Lamp | | #47 |

## CABINETS & CABINET PARTS

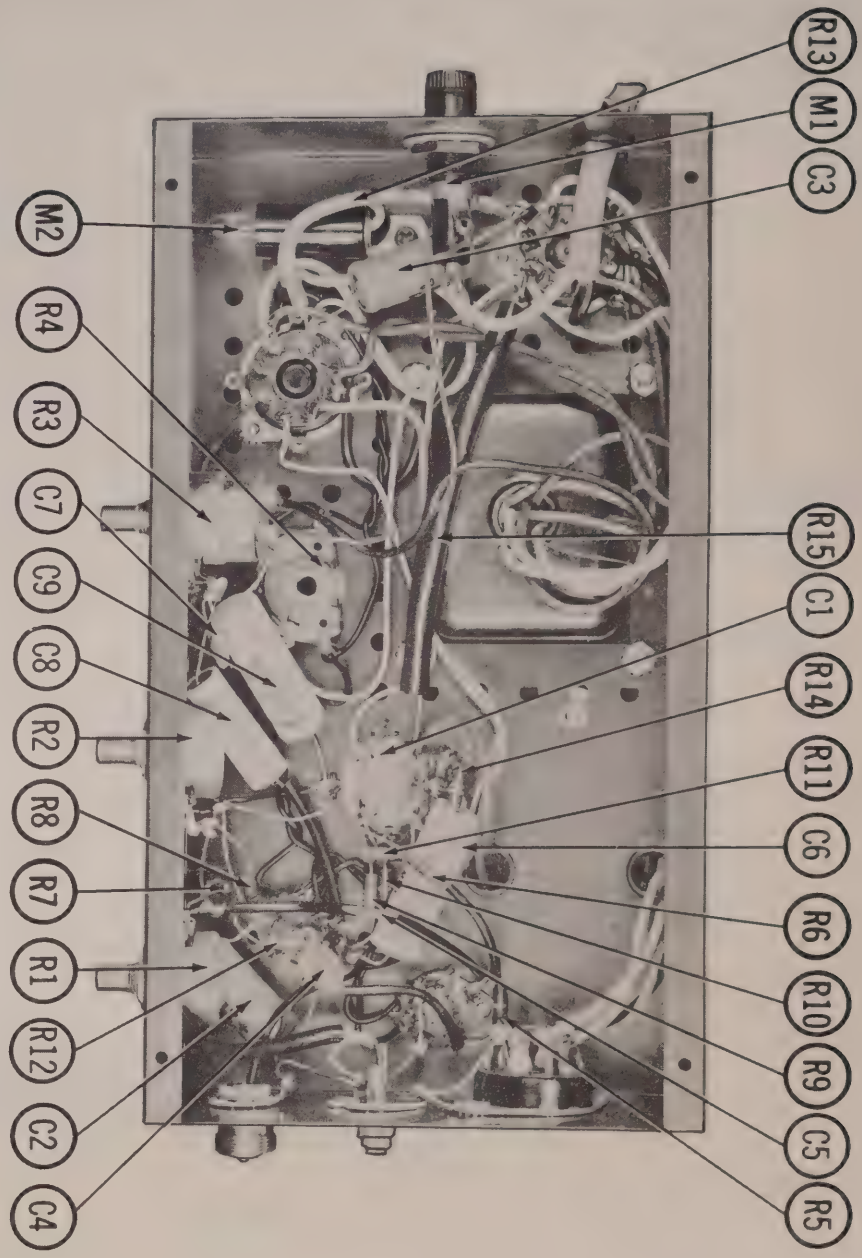
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

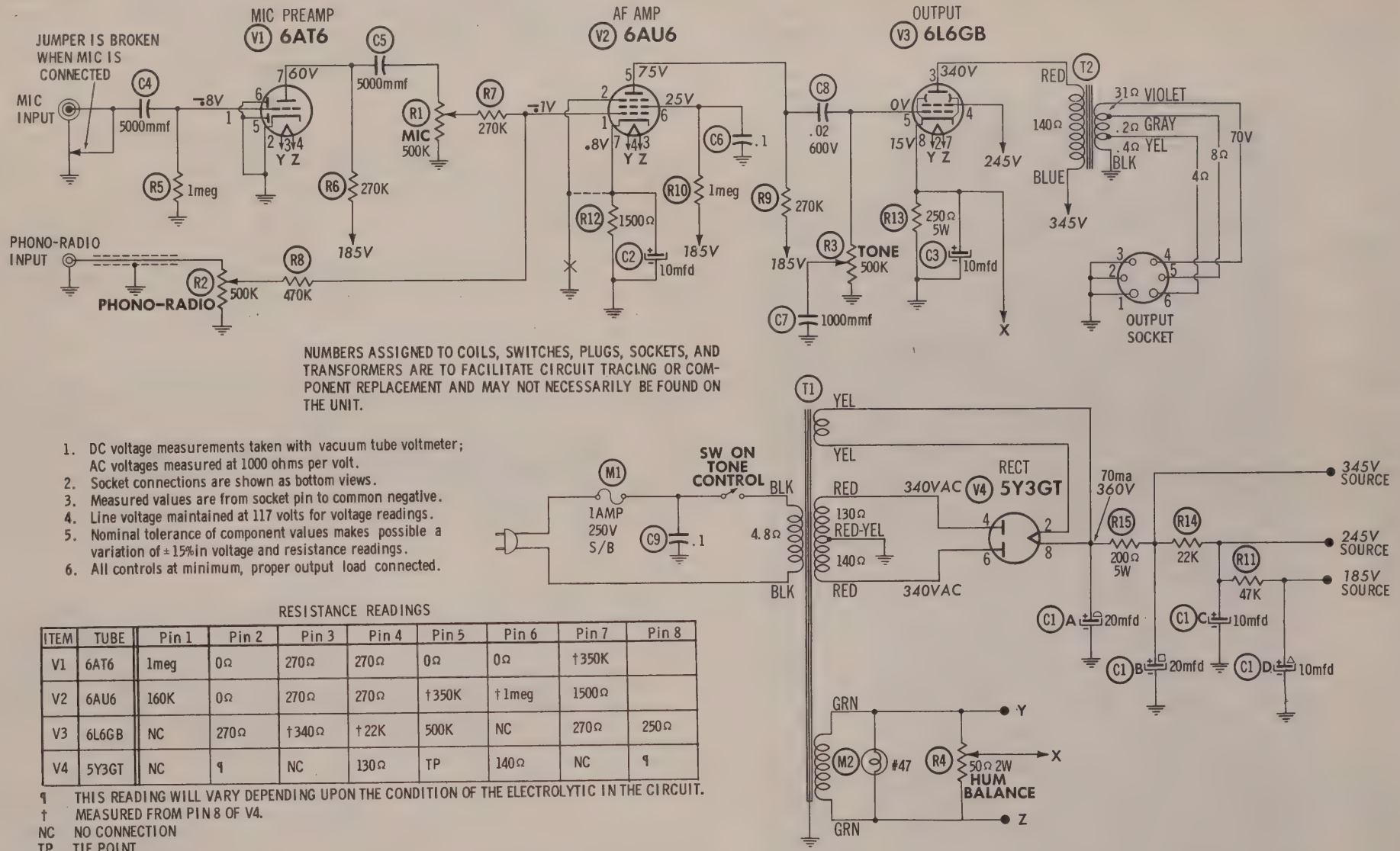
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

## CHASSIS—BOTTOM VIEW






NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V1 | 6AT6 | 1meg | 0Ω | 270Ω | 270Ω | 0Ω | 0Ω | †350K | |
| V2 | 6AU6 | 160K | 0Ω | 270Ω | 270Ω | †350K | †1meg | 1500Ω | |
| V3 | 6L6GB | NC | 270Ω | †340Ω | †22K | 500K | NC | 270Ω | 250Ω |
| V4 | 5Y3GT | NC | ¶ | NC | 130Ω | TP | 140Ω | NC | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**MASCO**
**MODELS A-10, AS-10**

PHOTOFACT* Folder

EIA

**MASCO**
**MODELS A-18, AS-18**

MASCO
MODELS A-18, AS-18

MODEL A-18

MASCO
MODELS A-18, AS-18

| | |
|---|---|
| TRADE NAME | Masco Models A-18, AS-18 |
| MANUFACTURER | Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N.Y. |
| TYPE SET | AC Operated 5 Tube, 2 Channel Audio Amplifier |
| POWER SUPPLY | 110-120/130 Volts AC, 50-60 Cycles RATING 88 Watts, .8 Amp. @ 117 Volts AC |

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J52



SET 445 FOLDER 7

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Mic Preamplifier | 6AU6 | |
| V2 | AF Amp. -Phase Inv. | 12AX7 | |
| V3 | Output | 6L6GB | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V4 | Output | 6L6GB | |
| V5 | Rectifier | 5V4G | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | MASCO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 16 | 450 | | PRS450V16 | BR1645 | TC74 | TD-16-450 | TVA-1708 | |
| C2A | ▲10 | 450 | | AFH4-10 | D0088 | FP434 | TMQ-10 | TVLS-3776.1* | |
| B | ▲10 | 450 | | | | | | | |
| C | ▲10 | 450 | | | | | | | |
| C3 | 10 | 50 | | PRS50V10 | BBR10-50 | TC32 | TD-10-50 | TVA-1304 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | MASCO PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C4 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C5 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C6 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C7 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C8 | .01 | 600 | | | P688N-01 | D6-103 | CUB6S1 | GEM-611 | 6TM-S1 | |
| C9 | .01 | 600 | | | P688N-01 | D6-103 | CUB6S1 | GEM-611 | 6TM-S1 | |
| C10 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MASCO PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 500K | ½ | BA811-1958 | B-60 | A47-500K-Z | Q13-133 | U48 | Mic Volume |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R2A | 500K | ½ | BA811-1958 | B-60 | A47-500K-Z | Q13-133 | U48 | Phono-Radio Volume |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R3A | 500K | ½ | BA811-1958 | B-60 | A47-500K-Z | Q13-133 | U48 | Tone |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |
| R4A | 50Ω | 2(WW) | 1328 | WW-500 | A43-50 | W11-050 | C50P | Hum Balance |
| B | Shaft | | | Not Req. | FKS-1/2 | SK5 | Not Req. | |

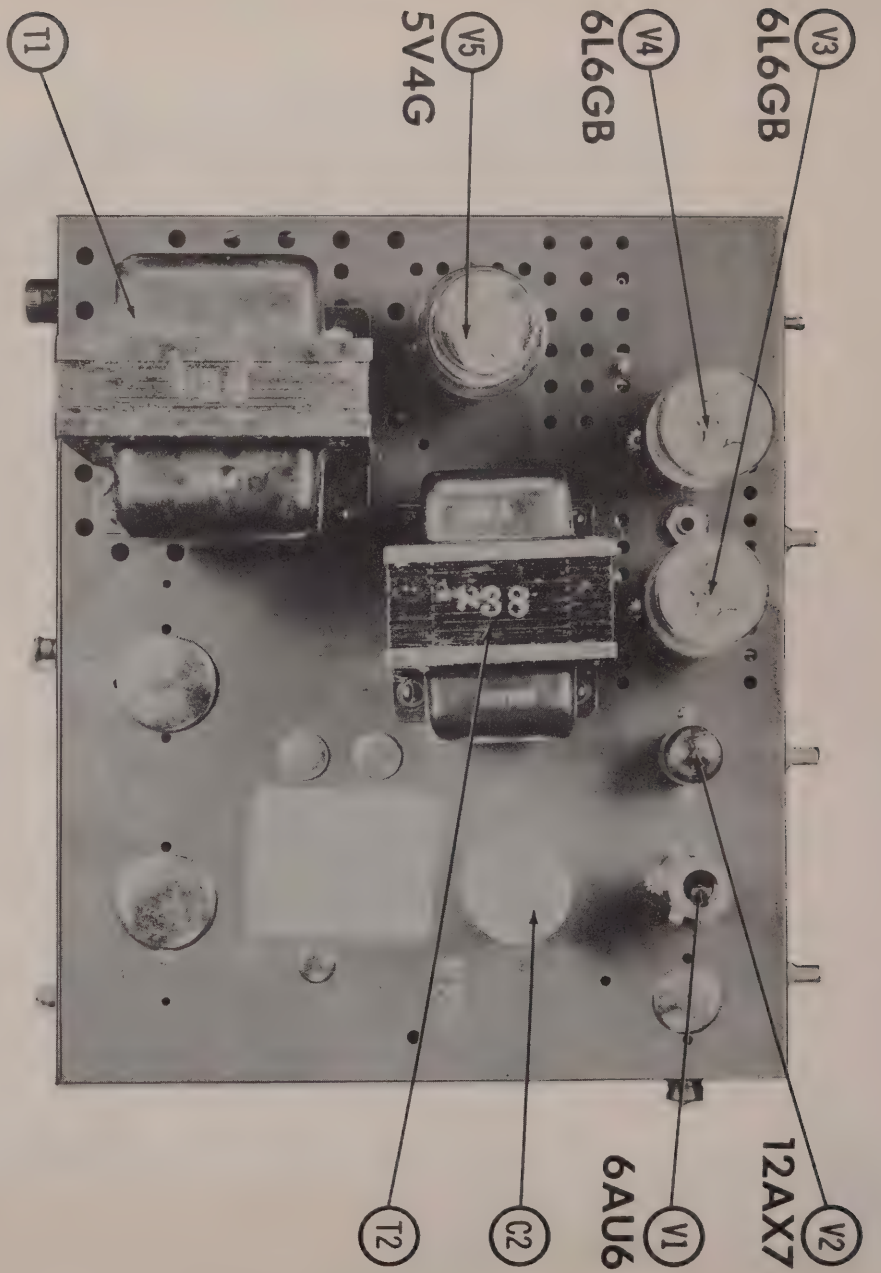
## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | MASCO PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R5 | 150K | | | |
| R6 | 1meg | | | |
| R7 | 270K | | | |
| R8 | 100K | 1 | | |
| R9 | 1meg | | | |
| R10 | 100K | 1 | | |
| R11 | 1000Ω | | | |
| R12 | 100K | 1 | | |

| ITEM No. | RATING | | MASCO PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R13 | 470K | | | |
| R14 | 10K | 1 | | |
| R15 | 4700Ω | 2 | | |
| R16 | 470K | | | |
| R17 | 200Ω | | | |
| R18 | 125Ω | 5 | | |
| R19 | 27K | | | |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Con't)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | MASCO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 130V tap @117V @ .80A | 760VCT @ .150A | 5V @2A | P-236 | 22R33 ① | P-3155 ① | | PC8412 ① | 22R33 ① | R-18A ① |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V @ 2.6A | | | | | | | | | |

① Drill new mounting holes. Does not have 130V winding.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | MASCO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 6000Ω CT | 500Ω tap @ 70V, 16Ω 8Ω, 4Ω | T-236 | | | | | | | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | MASCO PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | 3AG | 3A 250V | | | 312003. (3AG 3A 250V) | 342001 | AGC 3 | HKP |

## MISCELLANEOUS

| ITEM No. | PART NAME | MASCO PART No. | NOTES |
|---|---|---|---|
| M2 | Lamp | | #47 |
| M3 | Switch | | Power-On-Off, SPST (Toggle Type) |

## CABINETS & CABINET PARTS

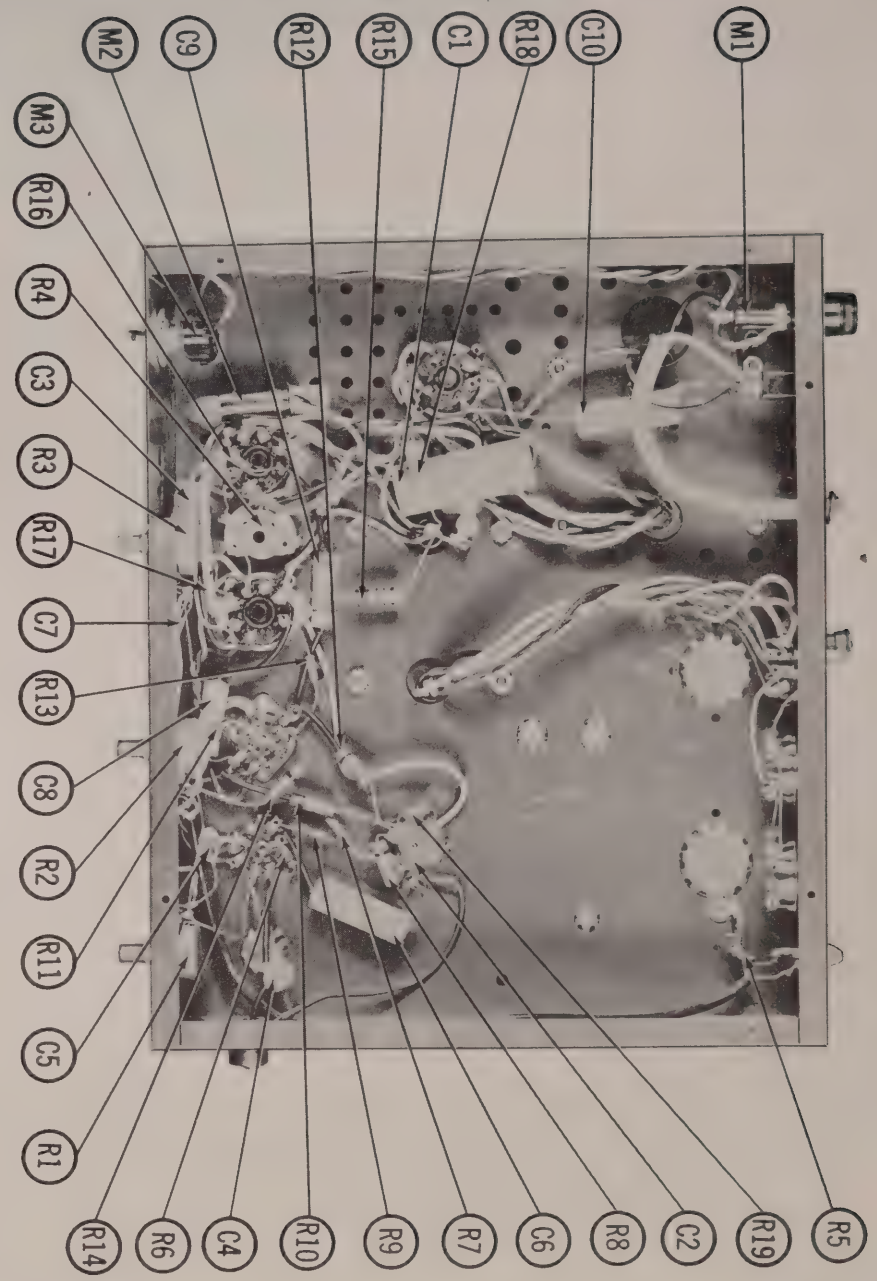
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

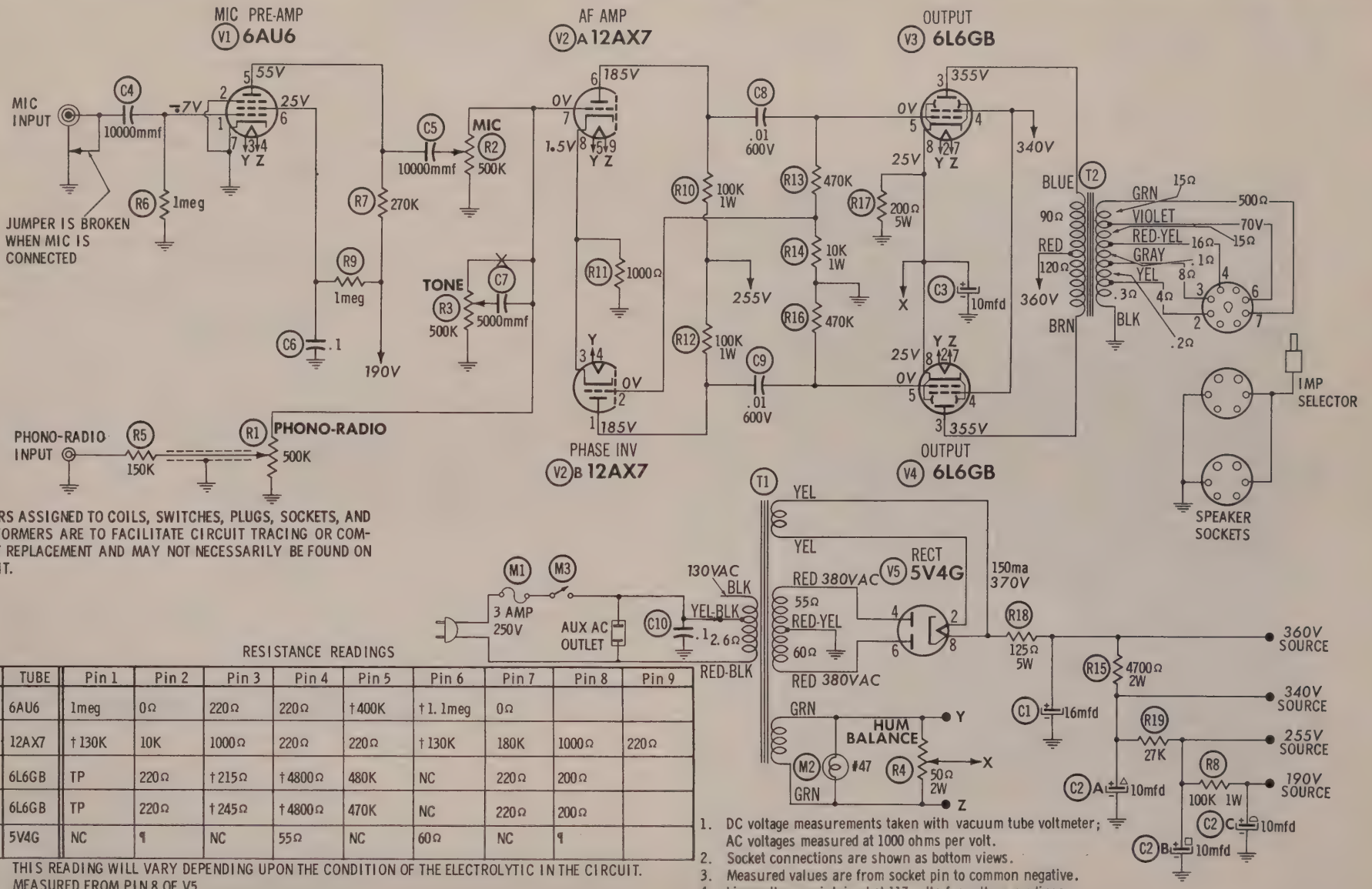
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

## CHASSIS—BOTTOM VIEW






NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6AU6 | 1meg | 0Ω | 220Ω | 220Ω | †400K | †1.1meg | 0Ω | | |
| V2 | 12AX7 | †130K | 10K | 1000Ω | 220Ω | 220Ω | †130K | 180K | 1000Ω | 220Ω |
| V3 | 6L6GB | TP | 220Ω | †215Ω | †4800Ω | 480K | NC | 220Ω | 200Ω | |
| V4 | 6L6GB | TP | 220Ω | †245Ω | †4800Ω | 470K | NC | 220Ω | 200Ω | |
| V5 | 5V4G | NC | ¶ | NC | 55Ω | NC | 60Ω | NC | ¶ | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION. TP TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

**MASCO**
**MODELS A-18, AS-18**

PHOTOFACT* Folder

# MOTOROLA MODELS S16W, S17W, S18M, SK16W, SK17W, SK18M (Ch. HS-710, HS-711)

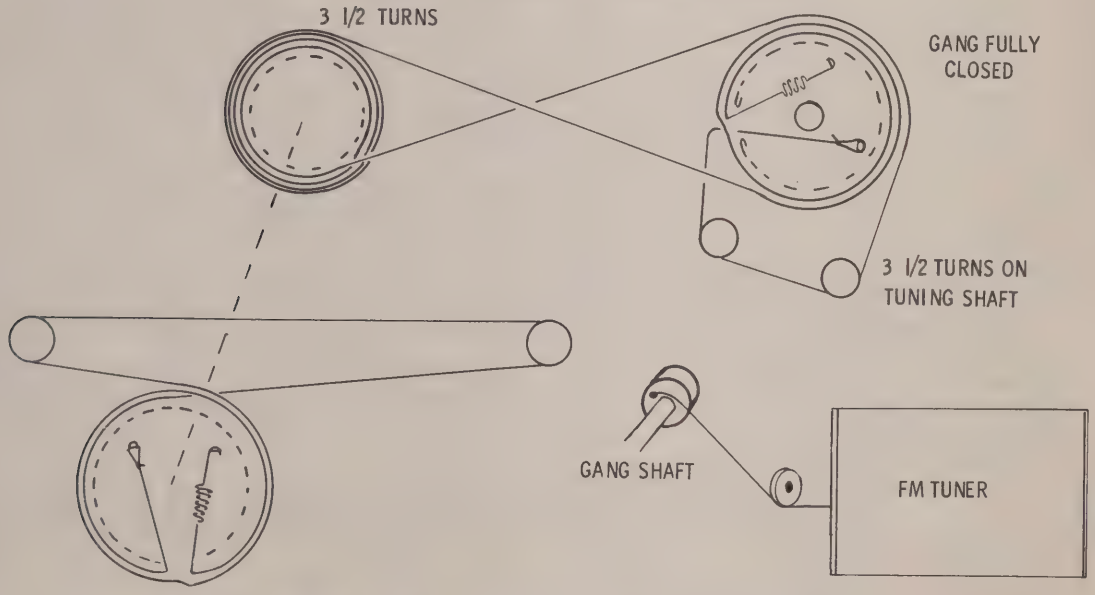
MOTOROLA MODELS S16W, S17W, S18M, SK16W, SK17W, SK18M (Ch. HS-710, HS-711)

MODEL SK18M

| | | | |
|---|---|---|---|
| TRADE NAME | Motorola Models SK16W, SK17W, SK18M (Tuner Ch. HS-710, Amp. Ch. HS-711) S16W, S17W, S18M (Right Channel Speaker System) | | |
| MANUFACTURER | Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois | | |
| TYPE SET | AC Operated 17 Tube FM-AM Tuner and Amplifier With 4 Speed Automatic Record Changer | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles | RATING | 160 Watts, 1.45 Amp. @ 117 Volts AC |
| TUNING RANGE | BROADCAST 535 - 1620KC | FREQ. MOD. | 88 - 108MC |

FOR SERVICE INFORMATION ON RECORD CHANGER VM24RC - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

## DIAL CORD STRINGING




**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

# TUNER PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | FM-RF Amp. - FM Conv. | 6BQ7A | |
| V2 | 1st FM IF Amplifier | 6BA6 | |
| V3 | AM RF Amplifier | 6BA6 | |
| V4 | AM Converter | 6BE6 | |
| V5 | 2nd FM-1st AM IF Amp. | 6BA6 | |
| V6 | 3rd FM IF Amplifier | 6AU6 | |
| V7 | Ratio Detector | 6AL5 | |
| V8 | Tuning Indicator | EM81/6DA5 | |
| V9 | Left Channel AF Amplifier | 12AX7A | |
| V10 | Right Channel AF Amp | 12AX7A | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 10 | 400 | 23B642409 | PRS450V10 | BR1045 | TC72 | TD-10-450 | TVA-1705 | |
| C2 | 8 | 50 | 23A638536 | PRS150V8 | BBR10-50 | TC41 | TD-8-150 | TVA-1405 | |

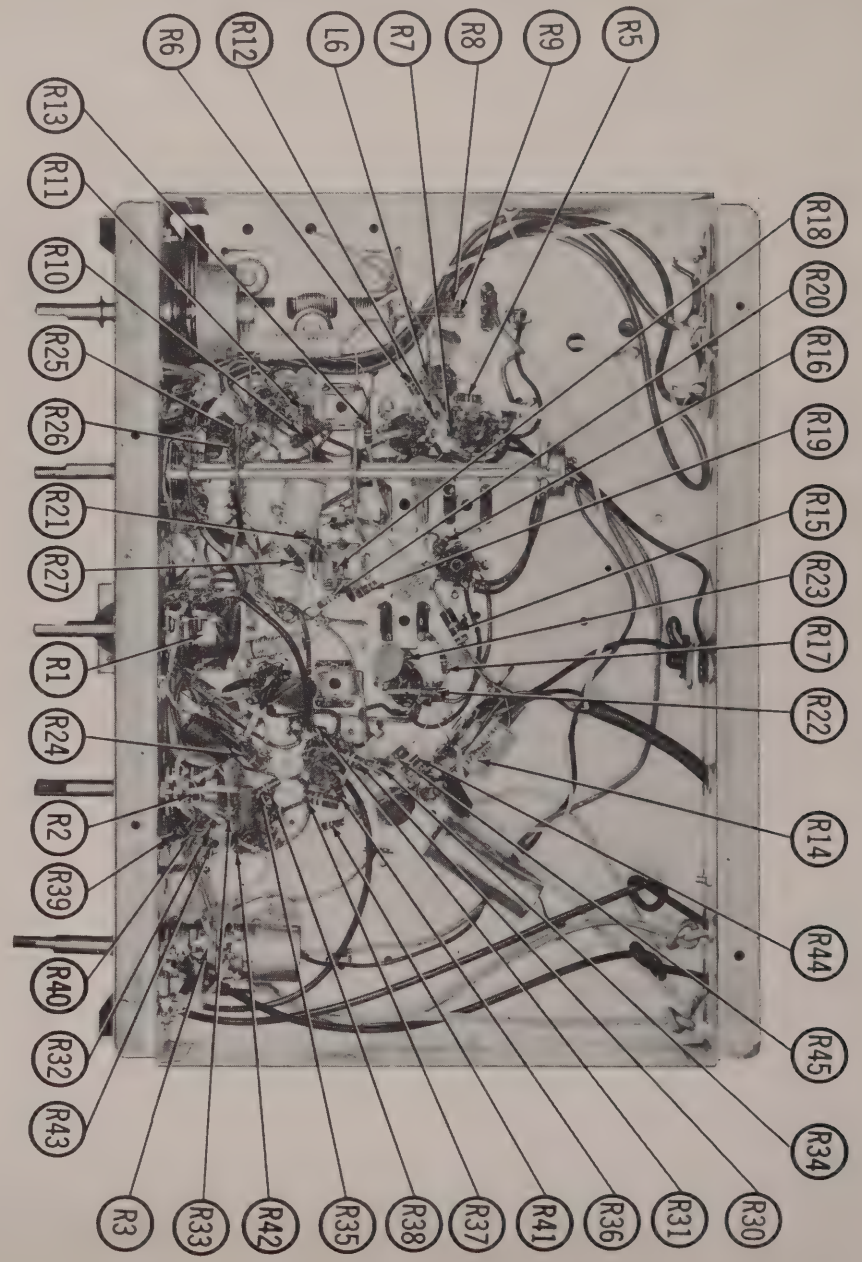
## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | MOTOROLA PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C3 | 10 | | N750 | 21K640021 | N750-SI 10 | TCN-10 | C10Q1U | CN7-410 | 5TCU-Q1 | |
| C4 | 1000 | | | 21K640022 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C5 | | | | 20K640023 | | | | | | |
| C6 | 1000 | | | 21K640022 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C7 | 20 | | NPO | 21K640024 | NPO-SI 20 | TCZ-20 | C10Q2C | CNO-420 | 5TCC-Q2 | |
| C8 | 20 | | NPO | 21K640024 | NPO-SI 20 | TCZ-20 | C10Q2C | CNO-420 | 5TCC-Q2 | |
| C9 | | | | 20K640025 | | | | | | |
| C10 | 10 | | N470 | 21K640026 | | | | | | |
| C11 | 15 | | NPO | 21K640028 | NPO-SI 15 | TCZ-15 | C10Q15C | CNO-415 | 5TCC-Q15 | |
| C12 | 8.2 | | P100 | 21K640027 | | | | | | |
| C13 | 68 | | N750 | 21K640029 | N750-SI 68 | TCN-68 | C10Q68U | CN7-468 | 5TCU-Q68 | |
| C14 | 5000 | | | 21R122871 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C15 | 2000 | | | 21K121836 | BPD-002 | DD-202 | BYA10D2 | B-220 | 5HK-D2 | |
| C16 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C17 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C18 | 1.3-11 | | | 20B641777 | | | | | | |
| C19 | .05 | 200 | | 8R121005 | P288N-05 | DF-503 | CUB2S5 | GEM-415 | 2TM-S5 | |
| C20 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C21 | 10000 | | | 21R121946 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C22 | .1 | 600 | | 8R121869 | P688N-1 | DF-104 | CUB6P1 | GEM-601 | 6TM-P1 | |
| C23 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C24 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C25 | 10000 | | | 21R121946 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C26 | .05 | 600 | | 8R122185 | P688N-05 | DF-503 | CUB6S5 | GEM-615 | 6TM-S5 | |
| C27 | 220 | | 10% | 21R125999 | DI 220 | MD-221 | L10T22 | JL-322 | 5GA-T22S 10% * | ① |
| C28 | 56 | | N750 10% | 21R120872 | N750-DI 56 | DTN-56 | C10Q56U | CN7-456 | 5TCU-Q56S 10%* | ② |
| C29 | 47 | | N750 | 21R115593 | N750-DI 47 | DTN-47 | C10Q47U | CN7-447 | 5TCU-Q47S 10%* | |
| C30 | 10000 | | | 21R482726 | BPD 01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C31 | 100 | | N750 10% | 21R400535 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1S 10% * | ② |
| C32 | 100 | | N750 10% | 21R400535 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1S 10% * | ② |
| C33 | .002 | 600 | | 8R121568 | P688N-002 | D6-202 | CUB6D2 | GEM-622 | 6TM-D2 | |
| C34 | .02 | 400 | | 8K128691 | P488N-02 | DD-203 | CUB4S2 | GEM-412 | 4TM-S2 | |
| C35 | .02 | 400 | | 8K128691 | P488N-02 | DD-203 | CUB4S2 | GEM-412 | 4TM-S2 | |
| C36 | 2000 | | | 21K121836 | BPD-002 | DD-202 | BYA10D2 | B-220 | 5HK-D2 | |
| C37 | 10000 | | | 21R121946 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C38 | .02 | 400 | | 8R128691 | P488N-02 | DD-203 | CUB4S2 | CUB412 | 4TM-S2 | |
| C39 | 2000 | | | 21R121106 | BPD-002 | DD-202 | BYA10D2 | B-220 | 5HK-D2 | |
| C40 | 100 | | N750 | 21R400537 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1 | ③ |
| C41 | 1000 | | | 21R410127 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C42 | 10000 | | | 21R121946 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C43 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C44 | .02 | 400 | | 8R128691 | P488N-02 | DD-203 | CUB4S2 | GEM-412 | 4TM-S2 | |
| C45 | 2000 | | | 21R121106 | BPD-002 | DD-202 | BYA10D2 | B-220 | 5HK-D2 | |
| C46 | 100 | | N750 | 21R400537 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1 | ③ |
| C47 | 1000 | | | 21R410127 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C48 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C49 | 10000 | | | 21R482726 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | ② |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions use 1000mmf (Part #8R122103) or 2000mmf (Part #8R121568) in this application.
② Not used in some versions.
③ Some versions may use 120mmf in this application.

# TUNER CHASSIS—BOTTOM VIEW



# TUNER PARTS LIST AND DESCRIPTIONS (cont)

## CONTROLS

| ITEM No. | RATING RESIST-ANCE | RATING WATTS | REPLACEMENT DATA MOTOROLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 1meg | ½ | 18B642127 | | | | | Loudness, Right Channel Taps @ 300K & 600K |
| B | 1meg | ½ | | | | | | Loudness, Left Channel Taps @ 300K & 600K |
| R2A | 2meg | ½ | 18B642126 | B-76 | AD47-2meg-S | Q13-139 | | Bass, Right Channel |
| B | 2meg | ½ | | SR-76 | Not Req. | M13-139 | ■ UE1877 | Bass, Left Channel |
| C | Shaft | | | Not Req. | FS-3 | Not Req. | | |
| R3A | 400K | ½ | 18C642343 | | | | | Balance, Taps @ 100K & 300K Stops at 100K each end |
| B | 2meg | ½ | | | | | | Treble, Right Channel |
| C | 2meg | ½ | | | | | | Treble, Left Channel |
| D | Switch | | | | | | | |

■ "STA-LOC" Equivalent: FA26A, RU26A, CS3500.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | MOTOROLA PART No. | NOTES |
|---|---|---|---|---|
| R4 | 1meg | | 17K640032 | |
| R5 | 27K | | 6K121300 | Note 1 |
| R6 | 1000Ω | | 6K121301 | |
| R7 | 150Ω | | 6K124797 | |
| R8 | 10K | | 6R6054 | |
| R9 | 10K | | 6R6054 | |
| R10 | 10K | 1 | 6K122319 | Note 2 |
| R11 | 68Ω | | 6R2039 | |
| R12 | 22K | | 6K119405 | |
| R13 | 100K | | 6K125534 | |
| R14 | 2200Ω | 5 | 17K641740 | |
| R15 | 3900Ω | 1 | 6R5618 | |
| R16 | 82Ω | | 6K127516 | |
| R17 | 100K | | 6K125534 | |
| R18 | 47K | | 6K121299 | |
| R19 | 3.3meg | | 6K119407 | |
| R20 | 390K | | 6R5646 | |
| R21 | 1meg | | 17K640032 | Note 1 |
| R22 | 10K | | 6K119932 | |
| R23 | 82Ω | | 6K127516 | |
| R24 | 100K | | 6K125534 | Note 1 |

| ITEM No. | RATING OHMS | RATING WATT | MOTOROLA PART No. | NOTES |
|---|---|---|---|---|
| R25 | 1meg | | 6K124494 | |
| R26 | 1meg | | 6K124494 | |
| R27 | 22K | | 6K119935 | Note 1 |
| R28 | 4.7meg | | 6K121277 | |
| R29 | 1meg | | 6K122324 | |
| R30 | 18K | 1 | 6K129185 | |
| R31 | 820Ω | | 6K121302 | |
| R32 | 22K | | 6K119935 | |
| R33 | 180K | | 6K125531 | |
| R34 | 100K | | 6K125534 | |
| R35 | 100K | | 6K125534 | |
| R36 | 1800Ω | | 6K122445 | |
| R37 | 18K | 1 | 6K129185 | |
| R38 | 820Ω | | 6K121302 | |
| R39 | 22K | | 6K119935 | |
| R40 | 180K | | 6K125531 | |
| R41 | 100K | | 6K125534 | |
| R42 | 100K | | 6K125534 | |
| R43 | 1800Ω | | 6K122445 | |
| R44 | 4700Ω | | 6K121847 | Note 3 |
| R45 | .5Ω | | 17K488266 | Note 4 |

Note 1. Not used in some versions.
Note 2. Some versions may use 2700Ω in this application (Part #6K119926).
Note 3. Some versions may use 1000Ω in this application (Part #6K121301).
Note 4. Some versions may use 1Ω 2W or 1.2Ω in this application.
Replace with .47Ω ½W (Part #17K488266).

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA MOTOROLA PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| L1 | FM Ant. Trans. | 25K640033 | | | | | |
| L2 | FM RF Coil | 24K640031 | | | | | Includes L3. |
| L3 | FM Osc. Coil | | | | | | Part of L2. |
| L4 | Loop Ant. | 1V642405 | | | | | Includes C18. Note 1 |
| L5 | AM RF Trans. | 24C634251 | | | | | |
| L6 | AM Osc. Trans. | 24B638340 | 14-1073 | BC-393 | 69-OSC | | |
| L7 | 1st FM IF Trans. | 25K640034 | | | | | Includes cores. |
| L8 | 1st AM IF Trans. | 24K641654 | 16-6758 | BC-352 | 12-C1 | RF-1 | |
| L9 | 2nd FM IF Trans. | 24K642112 | 16-3487 | FM-254 | 1463 | | |
| L10 | 2nd AM IF Trans. | 24K641655 | 16-6770 | BC-355 | 12-C6 | | Note 2 |
| L11 | 3rd FM IF Trans. | 24K638647 | | | | | |
| L12 | Ratio Detector | 24C638488 | 17-3498 | FM-255 | 1465 | | |

Note 1. Model SK16 uses #1V642422; Model SK17 uses #1V642412.

Note 2. Alternate #24K642707.

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | MOTOROLA PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Ratio Det. Circuitry | 300mmf, 300mmf, 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, 6800Ω, 6800Ω, 68K | 51B639144 | Centralab PC-342 |
| K2 | Left Chan. Tone Comp. | 50mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K | 51B641643 | Centralab PC-325 |
| K3 | Right Chan. Tone Comp. | 50mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K | 51B641643 | Centralab PC-325 |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA MOTOROLA PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | REMARKS |
|---|---|---|---|---|---|---|
| M1 | | 13-TB * | | | | * Includes needles and mounting mechanism. |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA MOTOROLA PART No. | JENSEN PART No. | WALCO PART No. | REMARKS |
|---|---|---|---|---|
| M2 | | S69X † or S69XSD †♦ or S69XDD ♦ | *W-103STSS † or *W-103STDS ♦† | * Includes Cartridge<br>† Jewel<br>♦ Diamond |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA MOTOROLA PART No. | CBS PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|
| M3 | | 48K636691 | 1N60 | 1N295 | AM Detector (Pigtail) |

## MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M4 | Lamp | 65R125595 | #1847 |
| M5 | Lamp | 65R125595 | #1847 |
| M6 | Lamp | 65R125595 | #1847 |
| M7 | FM Tuner | 77D638430 | (UT-343) Complete |
| M8 | Tuning Cap. | 19B641650 | AM, 3 Gang, Ant. 6-509mmf, RF 7-370mmf, Osc. 7-105mmf |
| M9 | Switch | 40D642125 | Compensator (7 Position, Rotary Wafer Type) |
| M10 | Switch | 40K643293 | Power On-Off (SPDT, Rotary Snap Type) |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A4, A8, A9..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5, A6, A7, A18, A19..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A10, A17..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A11, A12, A13, A14..... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537
A15, A16..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

AM ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .1mfd | High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis. | 455KC (400~ AM | AM | Tuning gang fully open | Across voice coil | A1, A2, A3, A4 | Adjust for maximum output. |
| 2. | | Loop | 1620KC | " | " | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 1400KC | " | 1400KC | " | A6, A7 | Adjust for maximum output. Chassis should be in cabinet when adjusting A7. |
| | The following steps are unnecessary unless the RF or oscillator coils have been tampered with or associated components have been replaced. | | | | | | | |
| 4. | .1mfd | High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis. | 1620KC | AM | Tuning gang fully open | Across voice coil | A5 | Adjust for maximum output. |
| 5. | " | " | 535KC | " | Tuning gang fully closed | " | A8 | Adjust for maximum output. Repeat steps 4 and 5 to cover full range. |
| 6. | | Loop | 1400KC | " | 1400KC | " | A6 | Adjust for maximum deflection. |
| 7. | | " | 600KC | " | 600KC | " | A9 | Adjust for maximum output. Repeat steps 6 and 7 until no further improvement is noted. A6 should be last adjustment. |

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 8. | | Across FM antenna terminals. | 10.7MC (Unmod.) | FM | High frequency end of dial | DC probe to point (A). Common to chassis. (Use negative scale.) | A10, A11, A12, A13 A14, A15 A16 | Adjust for maximum deflection. |
| 9. | | " | " | " | " | DC probe to point (B). Common to chassis. | A17 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 8 and 9 until no further improvement is noted. A17 should be last adjustment. |

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 8. | | Across FM antenna terminals. | 10.7MC (450KC Swp) | FM | High frequency end of dial | Vert. Amp. to point (A). Low side to chassis. | A10, A11 A12, A13 A14, A15 A16 | Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. |
| 9. | | " | " | " | " | Vert. Amp. to point (B). Low side to point (A). | A17 | Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines. |

FM RF ALIGNMENT

Length of FM tuner string should be about 2½" measured from tuner opening to gang shaft collar. To adjust, loosen collar set-screw, open gang fully, turn collar clockwise to remove slack from string. Tighten set-screw.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | Two 120Ω Carbon Resistors | Across FM antenna terminals with 120Ω in each lead. | 108.1MC (Unmod.) | FM | Tune to high end of band. | DC probe to point (A). Common to chassis. | A18 | Adjust for maximum deflection. |
| 11. | " | " | 98MC | " | 98MC | " | A19 | " |

FIG. 1

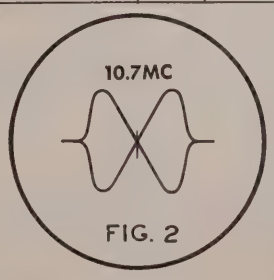
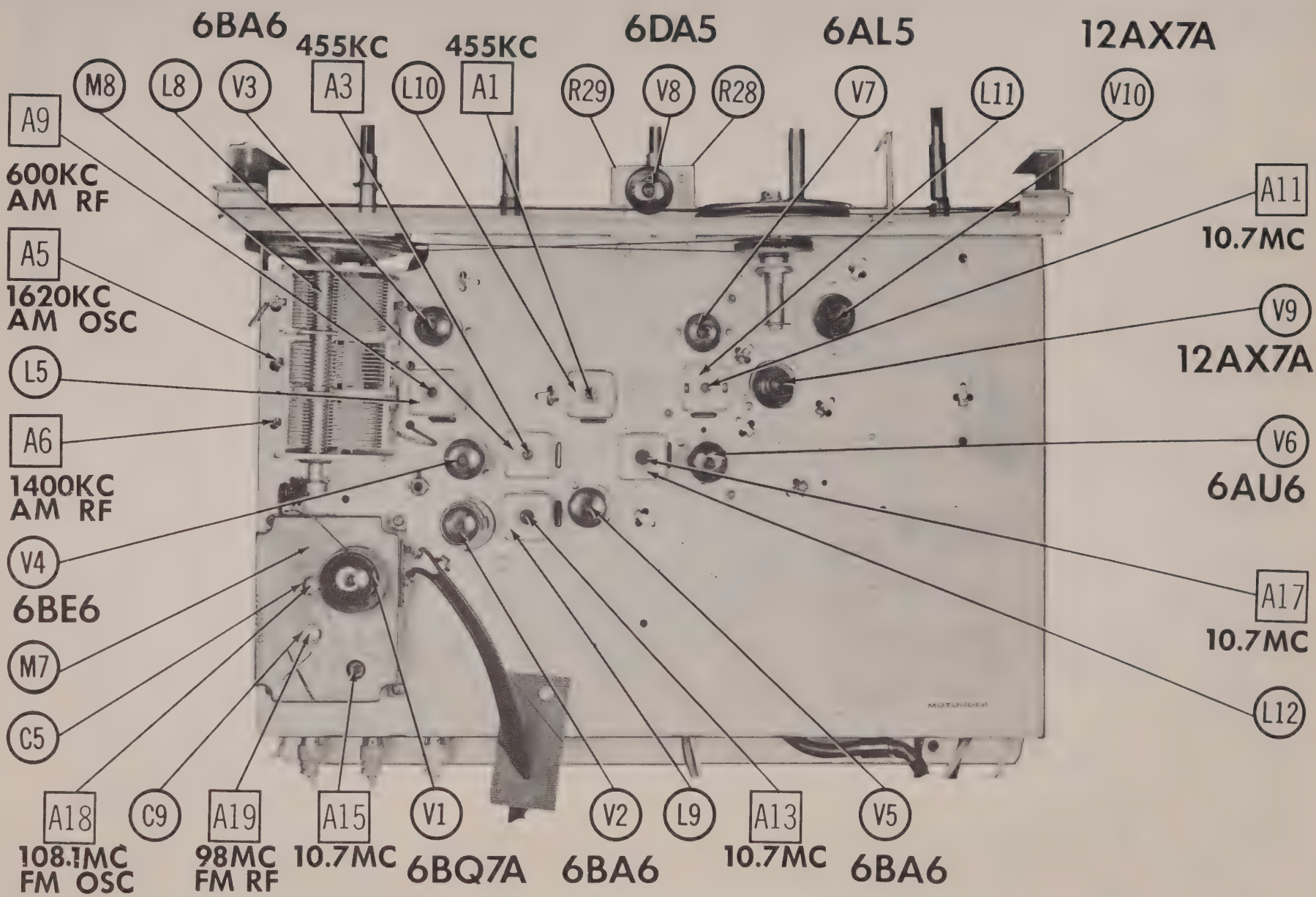
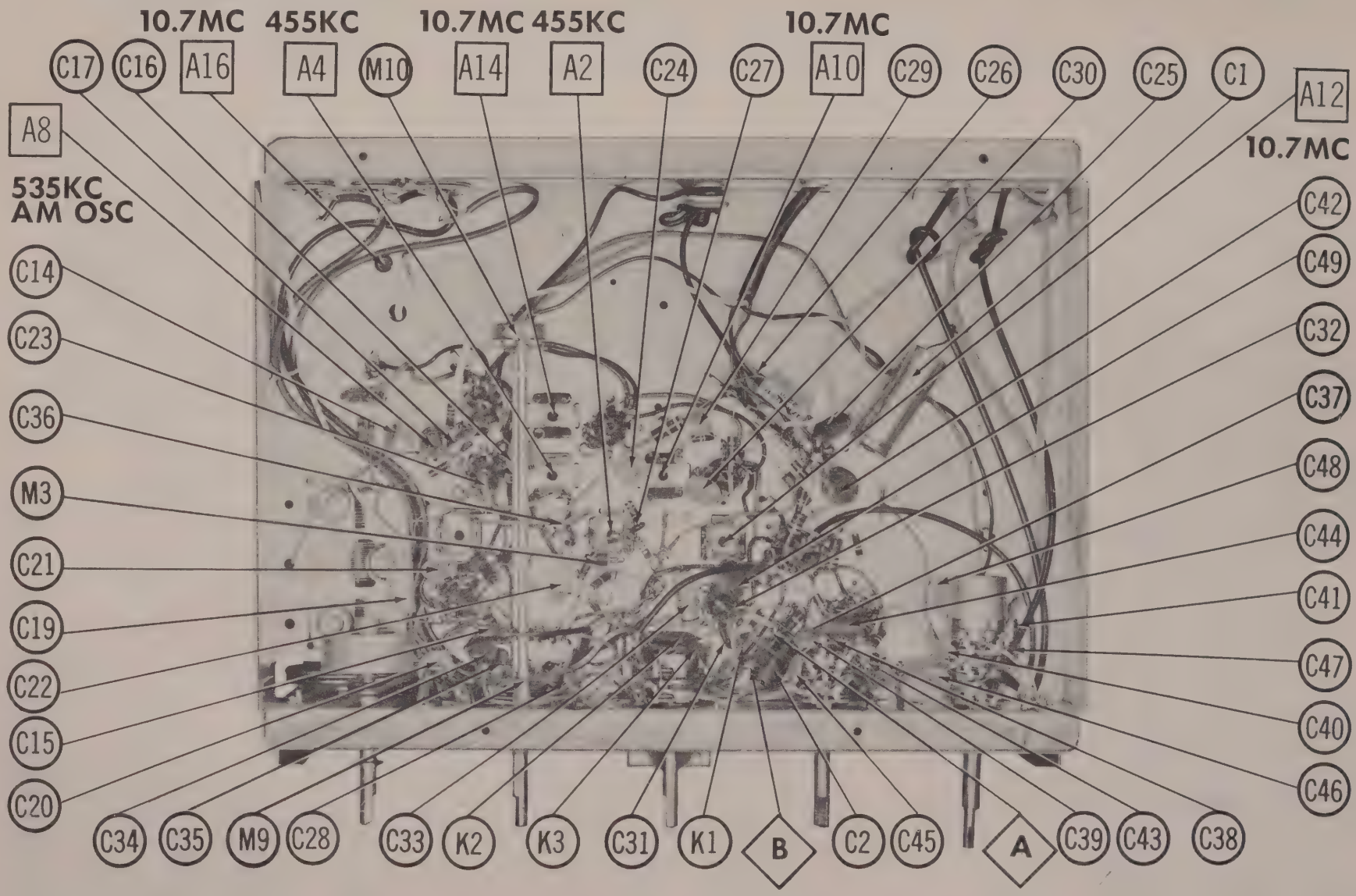


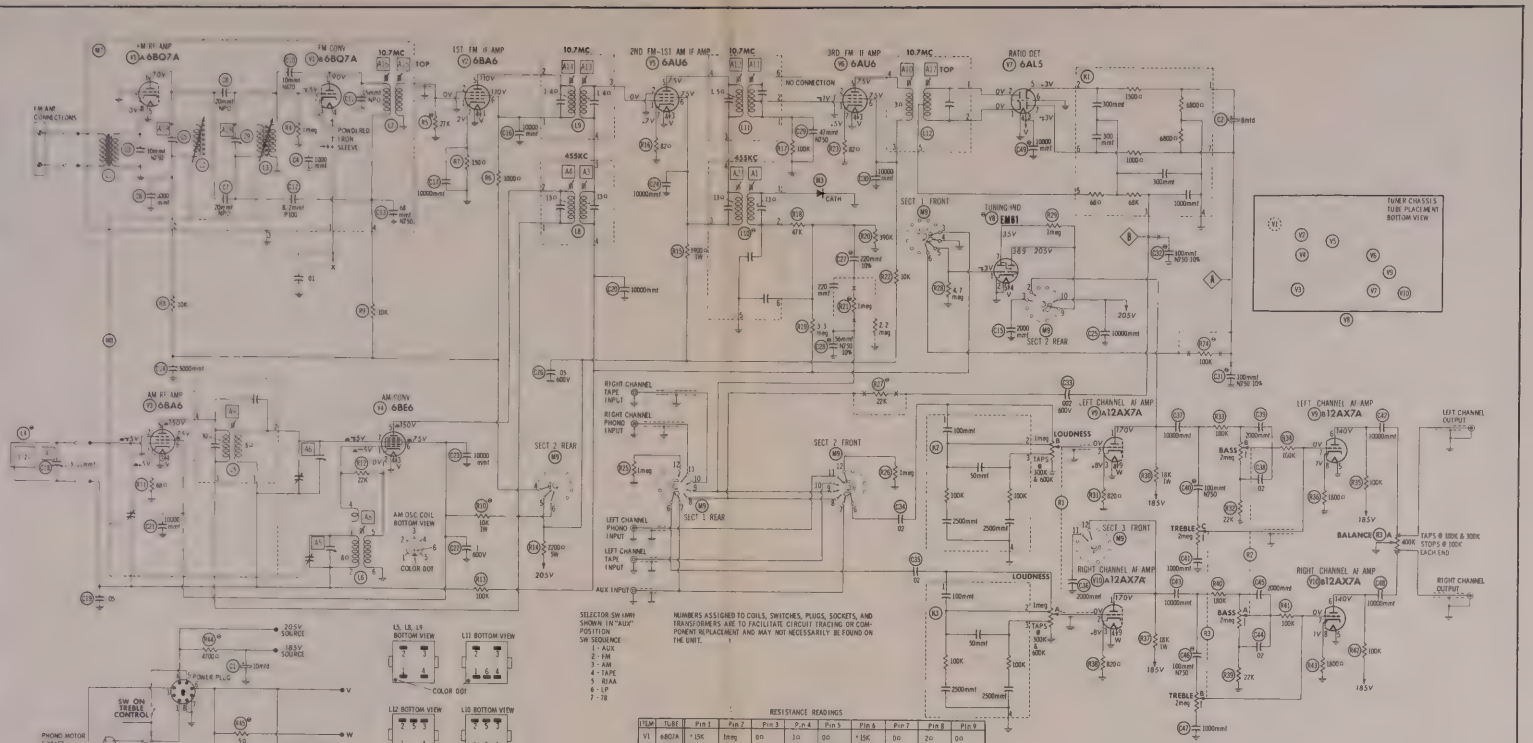
FIG. 2




TUNER CHASSIS - TOP VIEW




TUNER CHASSIS BOTTOM VIEW - CAPACITOR, MISC. & ALIGN. IDENT.




SELECTOR SW HAS SHOWN IN "AUX" POSITION
SW SEQUENCE
1 - AUX
2 - FM
3 - AM
4 - TAPE
5 - RIAA
6 - LP
7 - 78

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BQ7A | *15K | 1meg | 0Ω | 1Ω | 0Ω | *15K | 0Ω | 2Ω | 0Ω |
| V2 | 6BA6 | 1.6Ω | 0Ω | .1Ω | 0Ω | *570Ω | *570Ω | 150Ω | | |
| V3 | 6BA6 | *2.2meg | 0Ω | 0Ω | 1Ω | *470Ω | *15K | 68Ω | | |
| V4 | 6BE6 | *22K | 5Ω | 1Ω | 0Ω | *470Ω | *15K | *2.2meg | | |
| V5 | 6AU6 | 150 *2meg | 0Ω | .1Ω | 0Ω | *860Ω | *860Ω | 82Ω | | |
| V6 | 6AU6 | 100K | 6Ω | 1Ω | 0Ω | *15K | *15K | 82Ω | | |
| V7 | 6AL5 | 1NF | 1NF | 1Ω | 0Ω | 8300Ω | 0Ω | 7800Ω | | |
| V8 | EM81 6BN5 | 2meg | 0Ω | *2500Ω | .1Ω | 5Ω | NC | ¶1meg | *2500Ω | *2500Ω |
| V9 | 12AX7A | *25K | 0Ω | 820Ω | 0Ω | 0Ω | *110K | 120K | 1800Ω | 3Ω |
| V10 | 12AX7A | *25K | 0Ω | 820Ω | 0Ω | 0Ω | *110K | 120K | 1800Ω | 3Ω |

ALL MEASUREMENTS TAKEN IN "AM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* MEASURED IN "AM" POSITION.
† MEASURED FROM PINS OF V17.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

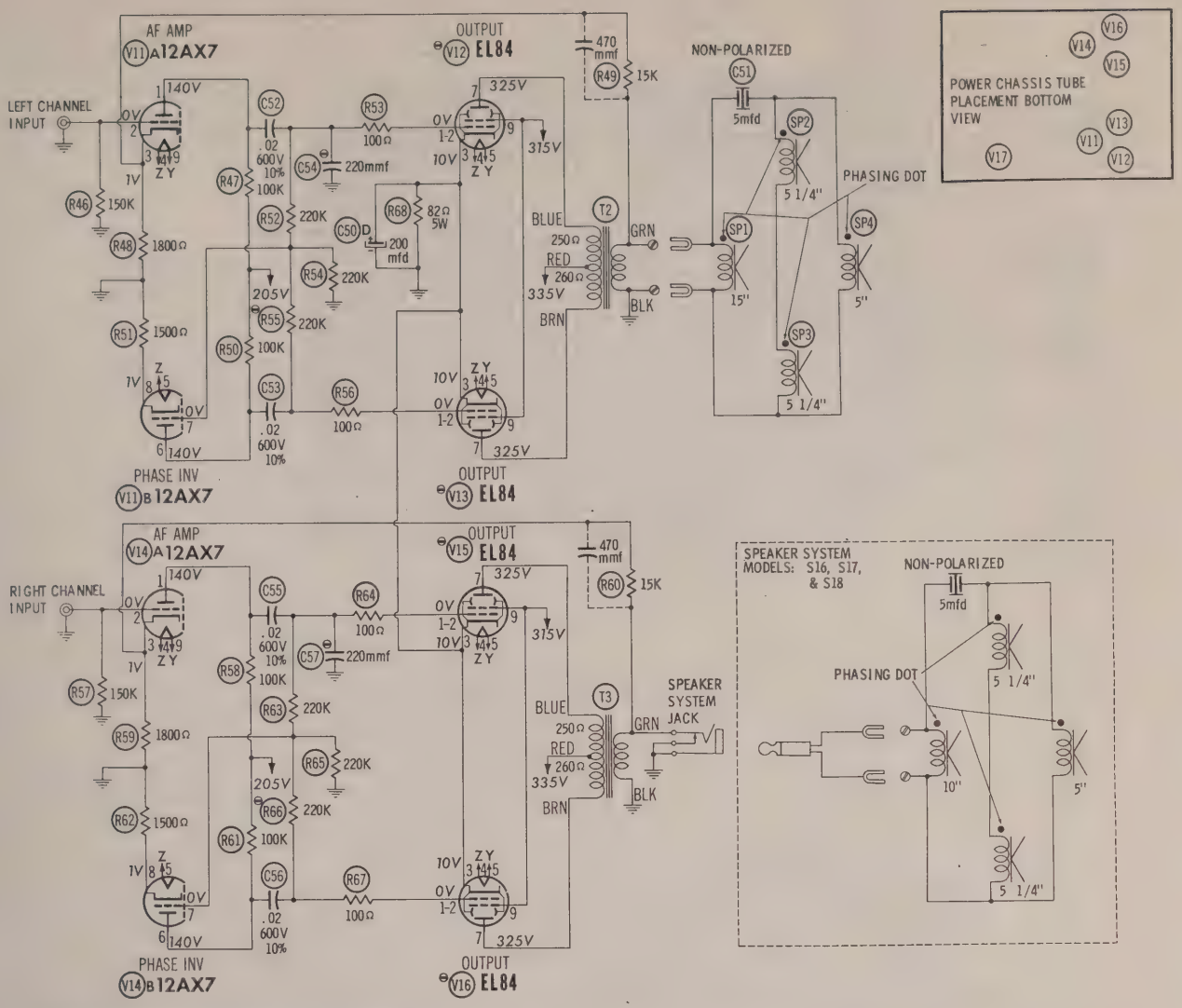
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1959

MOTOROLA MODELS S16W, S17W, S18M, SK16W, SK17W, SK18M (Ch. HS-710, HS-711)

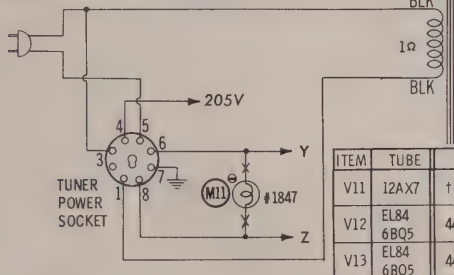
TUNER SCHEMATIC

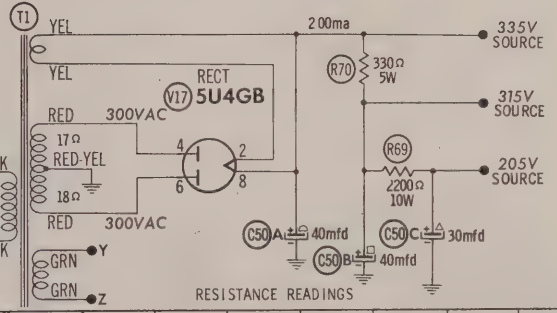



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM




| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V11 | 12AX7 | †100K | 150K | 1600Ω | 0Ω | 0Ω | †100K | 220K | 1500Ω | .1Ω |
| V12 | EL84 6BQ5 | 440K | 440K | 82Ω | 0Ω | .1Ω | NC | †250Ω | NC | †330Ω |
| V13 | EL84 6BQ5 | 440K | 440K | 82Ω | 0Ω | .1Ω | NC | †260Ω | NC | †330Ω |
| V14 | 12AX7 | †100K | 150K | 1600Ω | 0Ω | 0Ω | †100K | 220K | 1500Ω | .1Ω |
| V15 | EL84 6BQ5 | 440K | 440K | 82Ω | 0Ω | .1Ω | NC | †250Ω | NC | †330Ω |
| V16 | EL84 6BQ5 | 440K | 440K | 82Ω | 0Ω | .1Ω | NC | †260Ω | NC | †330Ω |
| V17 | 5U4GB | NC | ¶ | NC | 17Ω | NC | 18Ω | NC | ¶ | |

¶ THIS READING WILL VARY DEPENDING UPON THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V17.
NC NO CONNECTION.

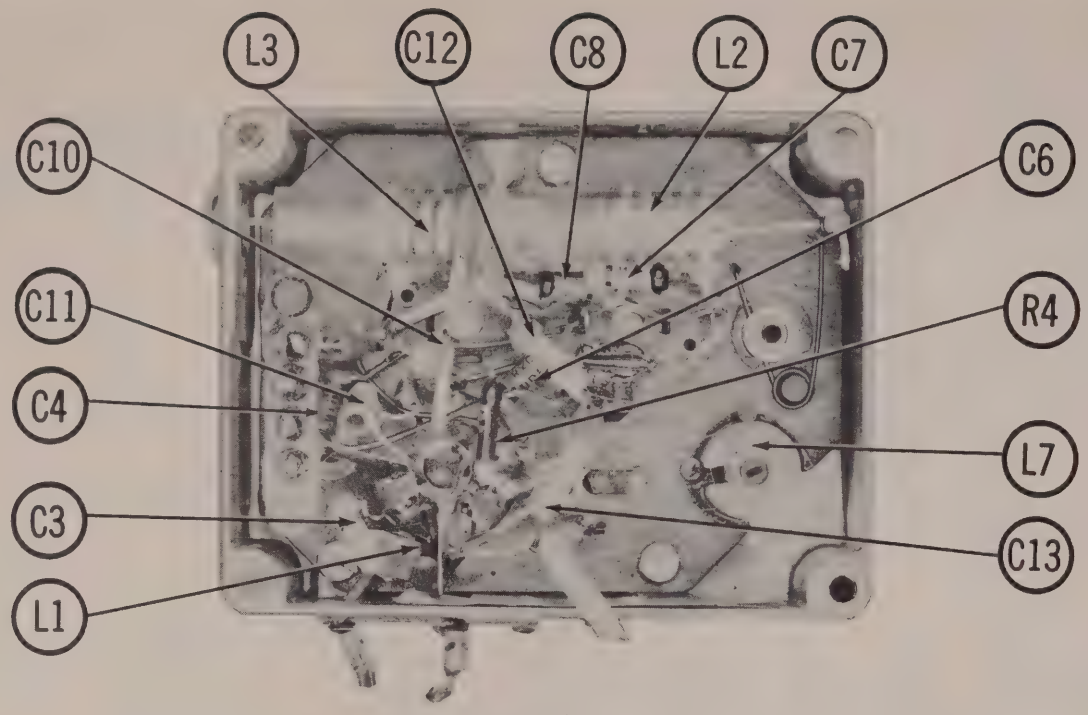
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

**MOTOROLA MODELS S16W, S17W, S18M, SK16W, SK17W, SK18M (Ch. HS-710, HS-711)**

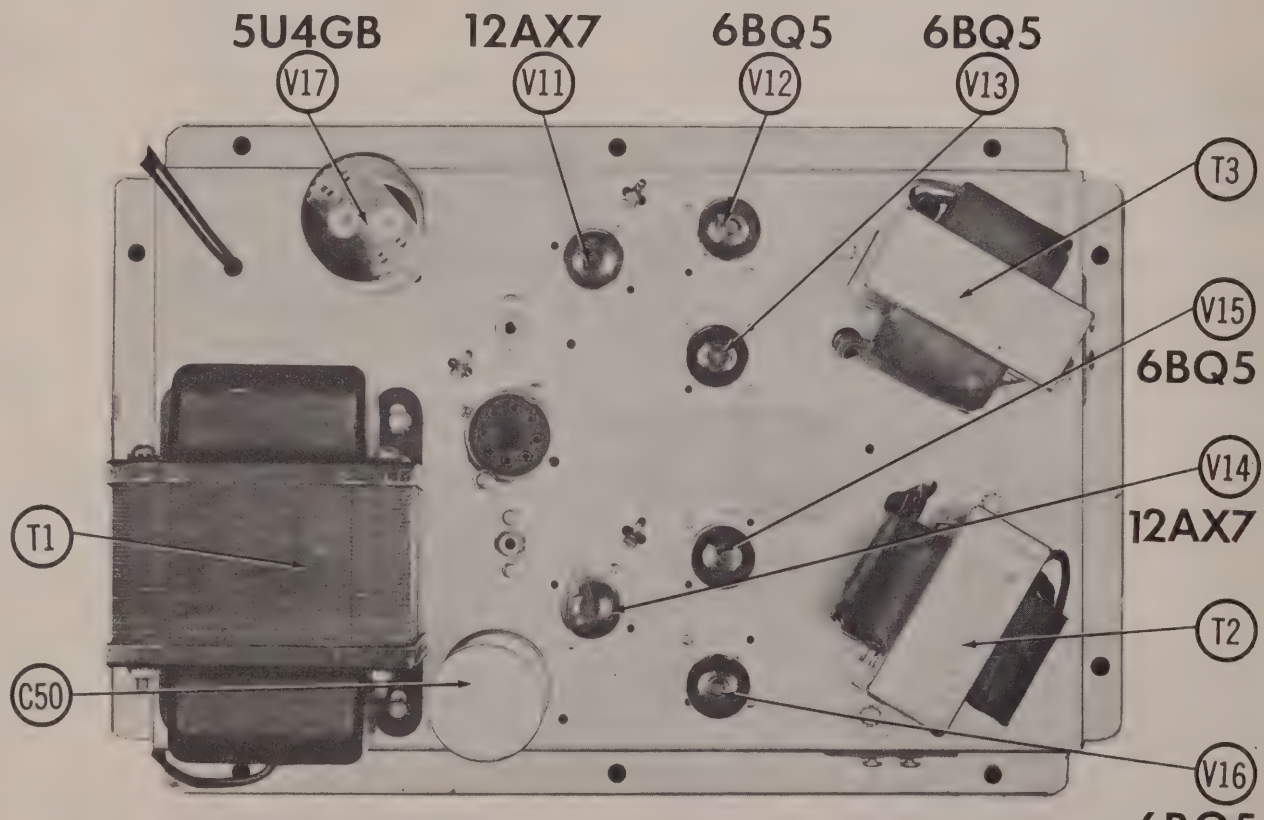
A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1959

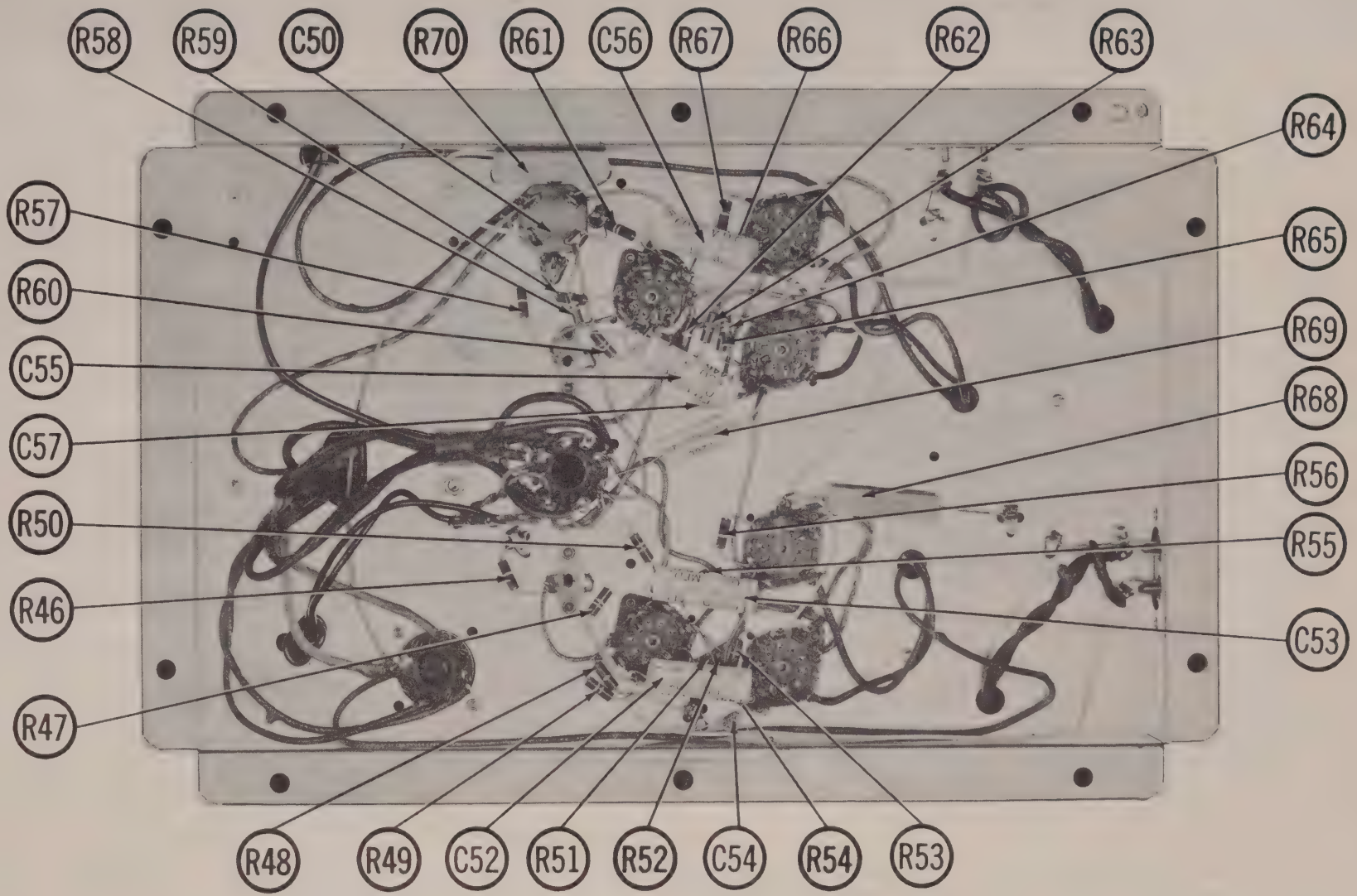
## AMP SCHEMATIC




FM RF SUB CHASSIS




AMP CHASSIS - TOP VIEW




AMP CHASSIS - BOTTOM VIEW

# AMP PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA)

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V11 | Left Channel AF Amp. - Left Channel Phase Inv. | 12AX7 | |
| V12 | Left Channel Output | EL84/6BQ5 | |
| V13 | Left Channel Output | EL84/6BQ5 | |
| V14 | Right Channel AF Amp. - Right Channel Phase Inv. | 12AX7 | |
| V15 | Right Channel Output | EL84/6BQ5 | |
| V16 | Right Channel Output | EL84/6BQ5 | |
| V17 | Rectifier | 5U4GB | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C50A | ▲40 | 400 | 23K642266 | AFH4-57-75 | C0350 | FP377. 2 | | TVLS-4667.2* | |
| B | ■40 | 400 | | | BR2502 | TC50025 | | | |
| C | ▲30 | 400 | | | | | | | |
| D | 200 | 25 | | | | | | | |
| C51 | 5 | 10AC | 23A632250 | AC-PRS10V8 | BBR10-25 † BBR10-25 † | TCN105 | | TVAS-1110 * | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

† Connect negative leads together.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | MOTOROLA PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C52 | . 02 | 600 | 10% | 8R122287 | DI 2000 | | PM6S2 | GEM-1612 | 6TM-S2S 10% * | |
| C53 | . 02 | 600 | 10% | 8R122287 | DI 2000 | | PM6S2 | GEM-1612 | 6TM-S2S 10% * | |
| C54 | 220 | | | 21R410115 | BPD-00022 | DD-221 | L10T22 | B-322 | 5GA-T22 | ① |
| C55 | . 02 | 600 | 10% | 8R122287 | DI 2000 | | PM6S2 | GEM-1612 | 6TM-S2S 10% * | |
| C56 | . 02 | 600 | 10% | 8R122287 | DI 2000 | | PM6S2 | GEM-1612 | 6TM-S2S 10% * | |
| C57 | 220 | | | 21R410115 | BPD-00022 | DD-221 | L10T22 | B-322 | 5GA-T22 | ① |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

① Not used in some versions.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | MOTOROLA PART No. | NOTES |
|---|---|---|---|---|
| R46 | 150K | | 6R6182 | |
| R47 | 100K | | 6K125534 | |
| R48 | 1800Ω | | 6K122445 | |
| R49 | 15K | | 6K119934 | |
| R50 | 100K | | 6K125534 | |
| R51 | 1500Ω | | 6K127513 | |
| R52 | 220K | | 6K122322 | |
| R53 | 100Ω | | 6R6326 | |
| R54 | 220K | | 6K122322 | |
| R55 | 220K | | 6K122322 | Note 5 |
| R56 | 100Ω | | 6R6326 | |
| R57 | 150K | | 6R6182 | |
| R58 | 100K | | 6K125534 | |
| R59 | 1800Ω | | 6K122445 | |
| R60 | 15K | | 6K119934 | |
| R61 | 100K | | 6K125534 | |
| R62 | 1500Ω | | 6K127513 | |
| R63 | 220K | | 6K122322 | |
| R64 | 100Ω | | 6R6326 | |
| R65 | 220K | | 6K122322 | |
| R66 | 220K | | 6K122322 | Note 5 |
| R67 | 100Ω | | 6R6326 | |
| R68 | 82Ω | 5 | 17K634893 | |
| R69 | 2200Ω | 10 | 17K642824 | |
| R70 | 330Ω | 5 | 17K642037 | |

Note 5. Some versions may use 270K in this application.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V @ 1.45A | 600VCT @ .200A | 5V @ 3A | 25D642131 | 26R91 ① | P-2836 ① | P-700 ① | P-8164 ① | 26R91 ① | R-67BC ① |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6. 3V @ 7A | | | | | | | | | |

① Use original shields.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 5500Ω CT | 6-8Ω | 25C641731 | 24S55 ① | A-2905 | AU-609 ① | A-3880 | 24S55 ① | S-57 Z ① | ① Drill new mounting hole |
| T3 | 5500Ω CT | 6-8Ω | 25C641731 | 24S55 ① | A-2905 | AU-609 ① | A-3880 | 24S55 ① | S-57 Z ① | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA MOTOROLA PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 15" | PM | 6-8Ω | 50C642735 | 15A10LF0 | ① Used in Models S16W, S17W, S18M |
| SP2 | 5 1/4" | PM | 14-16Ω | 50K638576 | 52A1Z15.5 | |
| SP3 | 5 1/4" | PM | 16Ω | 50K638577 | 52A1Z16 | |
| SP4 | 5 | PM | 8-10Ω | 50C638562 | 5A15TZ8.9 | |
| | 10" | PM | 6-8Ω | 50K642740 ① | | |
| | 5 1/4" | PM | 14-16Ω | 50K638576 ① | | |
| | 5 1/4" | PM | 16Ω | 50K638577 ① | | |
| | 5" | PM | 8-10Ω | 50C639562 ① | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M11 | Lamp | 65R125595 | #1847 (Models SK17, SK18 only) |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Bezel | 13D642018 | Lower Dial |
| Bezel | 13D641512 | Upper Dial |
| Knob | 36K641619 | Tuning |
| Knob | 36K641613 | Loudness |
| Knob | 36K641615 | Bass |
| Knob | 36C642334 | Treble |
| Knob | 36K642336 | Compensator |
| Knob | 36B642107 | Balance, Models SK16W, SK18M |
| Knob | 36K642107 | Balance, Models SK17W |
| Cabinet | 16E641364 | Walnut, Complete, Model SK16W |
| Cabinet | 16F641365 | Walnut, Complete, Model SK17W |
| Cabinet | 16F641366 | Mahogany, Complete, Model SK18M |
| Cabinet | 16E641960 | Walnut, Model S16W |
| Cabinet | 16K641966 | Walnut, Model S17W |
| Cabinet | 16E641965 | Mahogany, Model S18M |
| Legs | 16K749075 | Model SK16W |
| Lid | 16K642151 | Model SK16W |
| Lid | 16K642176 | Model SK17W |
| Lid | 16K642214 | Model SK18M |
| Door | 16K642152 | Model SK16W |
| Door | 16K642177 | Model SK17W |
| Door | 16K642215 | Model SK18M |
| Dial Pointer | 1K641665 | |
| Background Dial | 64C641590 | |
| Dial Scale | 34C641737 | |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA

# MOTOROLA MODELS
# SF11B, SF11N (Ch. HS-703)

MOTOROLA MODELS
SF11B, SF11N (Ch. HS-703)

MODEL SF11B

MOTOROLA MODELS
SF11B, SF11N (Ch. HS-703)

| | |
|---|---|
| TRADE NAME | Motorola Models SF11B, SF11N (Ch. HS-703) |
| MANUFACTURER | Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois |
| TYPE SET | AC Operated 4 Tube Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110 - 120 Volts AC, 60 Cycles RATING 30 Watts, .3 Amp. @117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER VM20RC, VM21RC OR VM25RC - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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J120

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Left Channel AF Amp- Right Channel AF Amp | 12AX7 | |
| V2 | Left Channel Output | 35C5 | |
| V3 | Right Channel Output | 35C5 | |
| V4 | Rectifier | 35W4 | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ■50 | 150 | 23K642088 | AFH3-11-50 | XC0105 | FP311-65 | TMT-10 | TVL-3442 | |
| B | ▲50 | 150 | | | | | | | |
| C | 50 | 150 | | | | | | | |
| C2 | 10 | 15NP | 23K737749 | NP-PRS25V10 | BBR20-25 †<br>BBR20-25 | TCN5010 | TD-20-150 †<br>TD-20-150 | TVAS-1155* | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

† Connect Negative Leads Together

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | REPLACEMENT DATA MOTOROLA PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C3 | .05 | 400 | | 8R121567 | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | ① |
| C4 | 2000 | | | 21R121106 | BPD-002 | DD-102 | BYA10D2 | B-220 | 5HK-D2 | |
| C5 | 5000 | | | 21R122871 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C6 | 2000 | | | 21R121106 | BPD-002 | DD-102 | BYA10D2 | B-220 | 5HK-D2 | |
| C7 | 100 | | N750 | 21R400537 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1 | |
| C8 | .02 | 200 | | 8R121003 | P288N-02 | DD-203 | CUB2S2 | GEM-412 | 2TM-S2 | |
| C9 | 2000 | | | 21R121106 | BPD-002 | DD-102 | BYA10D2 | B-220 | 5HK-D2 | |
| C10 | 5000 | | | 21R122871 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C11 | 2000 | | | 21R121106 | BPD-002 | DD-102 | BYA10D2 | B-220 | 5HK-D2 | |
| C12 | 100 | | N750 | 21R400537 | N750-DI 100 | DTN-100 | C10T1U | CN7-310 | 5TCU-T1 | |
| C13 | .02 | 200 | | 8R121003 | P288N-02 | DD-203 | CUB2S2 | GEM-412 | 2TM-S2 | |
| C14 | .1 | 400 | | 8R121006 | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | ② |
| C15 | .05 | 400 | | 8R128690 | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |

① Some versions may use .1mfd in this application (Mfgr. recommends replacing with .05mfd)
② Some versions may use .15mfd in this application (Mfgr. recommends replacing with .1mfd)

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA MOTOROLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2meg | | 18A642136 | | | | | Volume, Left Chan. Tap |
| B | 2meg | | | | | | | Volume, Right Chan. Tap |
| R2A | 1meg | | 18A642083 | | | | ■ UE3954 | Tone, Left Chan. |
| B | 1meg | | | | | | | Tone, Right Chan. |
| R3A | 500K | | 18A642135 | B-59 | A47-500K-S | Q11-133 | U50 | Balance |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |

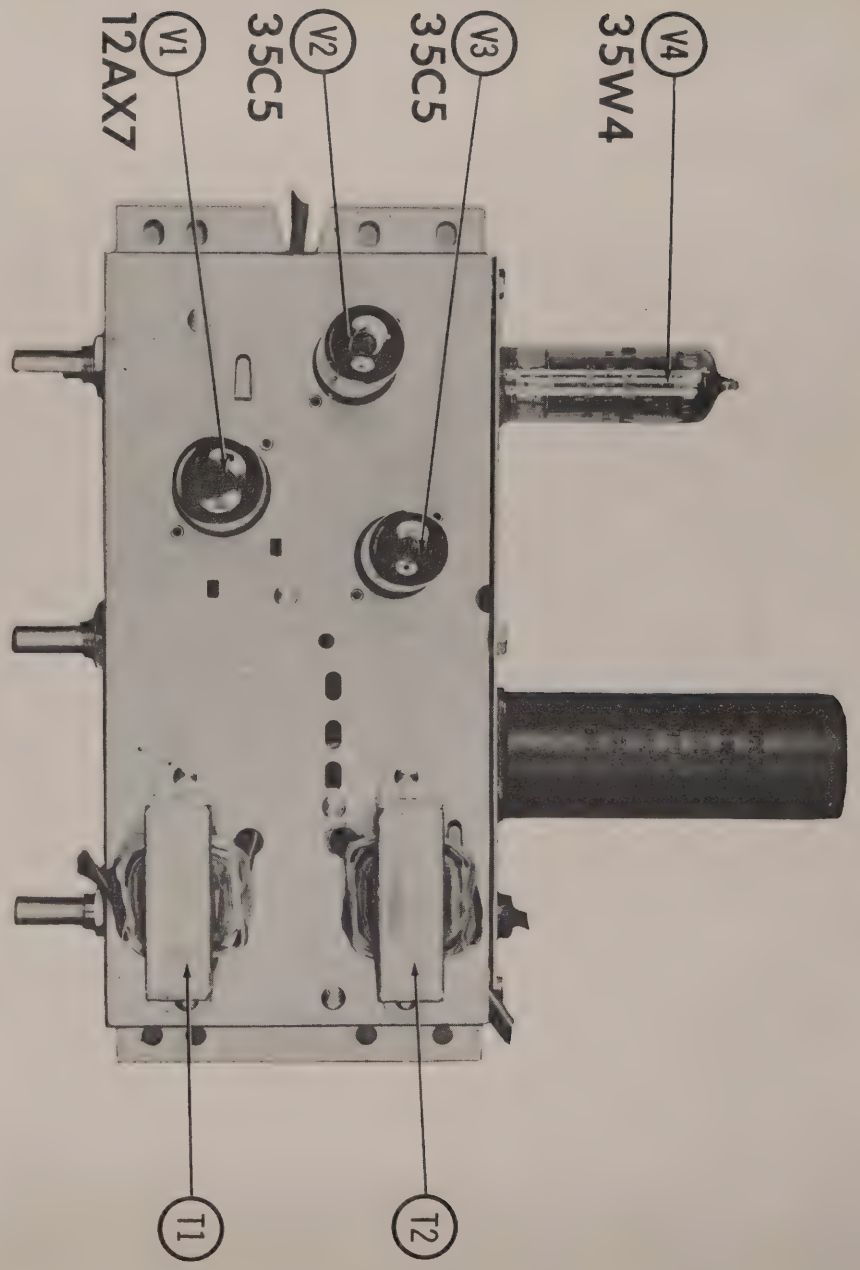
■ "STA-LAC" Equivalent: FA16R, RU16R, CS-3500

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | MOTOROLA PART No. | NOTES |
|---|---|---|---|---|
| R4 | 33K | | 6K127632 | |
| R5 | 3.3meg | | 6K121278 | |
| R6 | 220K | | 6K122322 | |
| R7 | 820Ω | | 6K121302 | |
| R8 | 1meg | | 6K124494 | |
| R9 | 22K | | 6K19935 | |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (cont)

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | MOTOROLA PART No. | NOTES |
|---|---|---|---|---|
| R10 | 120K | | 6K127540 | |
| R11 | 33K | | 6K127632 | |
| R12 | 3.3meg | | 6K121278 | |
| R13 | 220K | | 6K122322 | |
| R14 | 820Ω | | 6K121302 | |
| R15 | 1meg | | 6K124494 | |
| R16 | 22K | | 6K119935 | |
| R17 | 120K | | 6K127540 | |
| R18 | 1000Ω | | 6K127960 | |
| R19 | 100Ω | 1 | 6R488025 | |
| R20 | 47Ω | 1 | 6R118209 | |
| R21 | 15Ω | | 6R410033 | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 2600Ω | 6-8Ω | 25B642137 | 22S86 | A-2930 | AU-601 | A-3876 | 22S86 | S-3X | |
| T2 | 2600Ω | 6-8Ω | 25B642137 | 22S86 | A-2930 | AU-601 | A-3876 | 22S86 | S-3X | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA MOTOROLA PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 5 1/4" | PM | 6-8Ω | 50K642139① | 52A21Z7.3① | ① Phase |
| SP2 | 5 1/4" | PM | 6-8Ω | 50K642139① | 52A21Z7.3① | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA MOTOROLA PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | REMARKS |
|---|---|---|---|---|---|---|
| M1 | | * 13-TB | | | | * Includes mounting mechanism and needles |

## CABINETS & CABINET PARTS

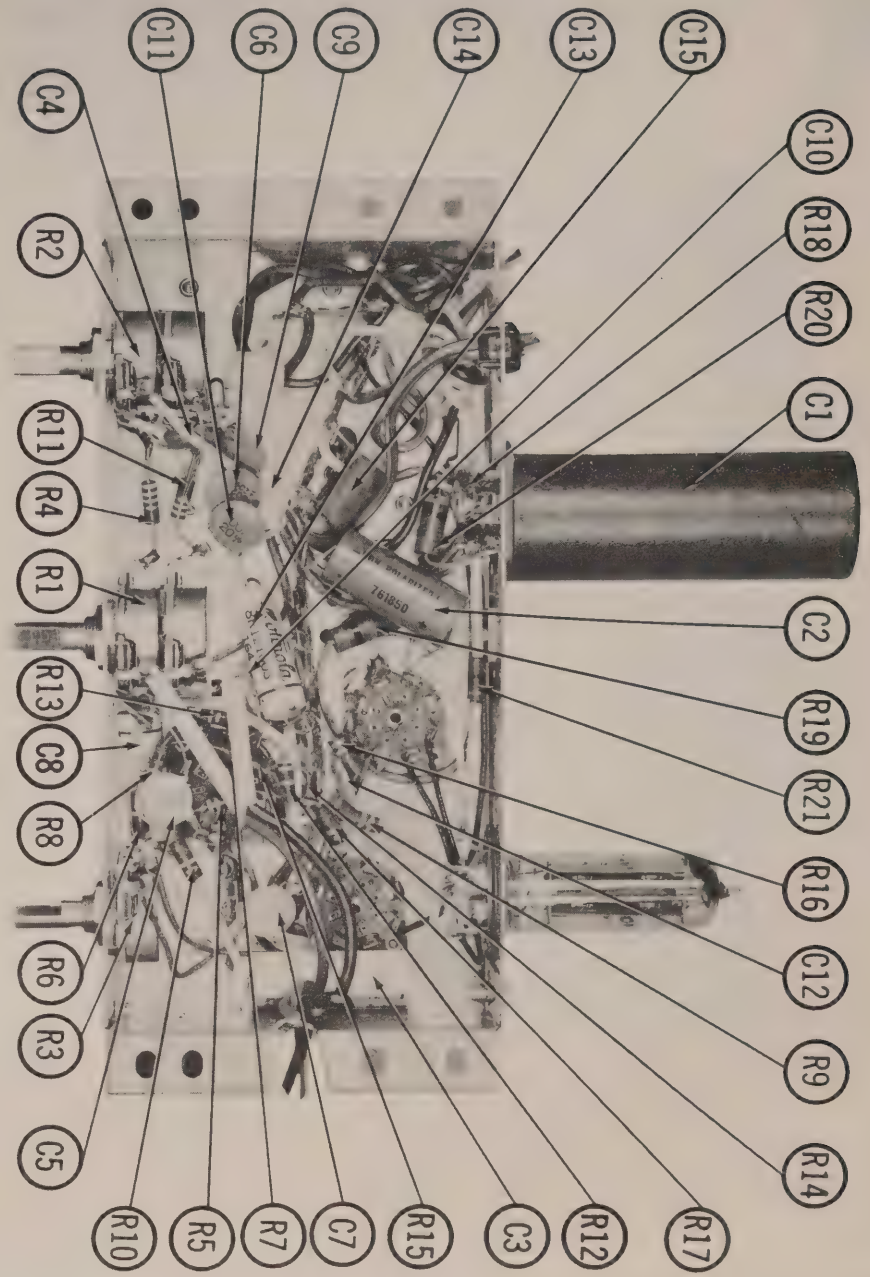
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

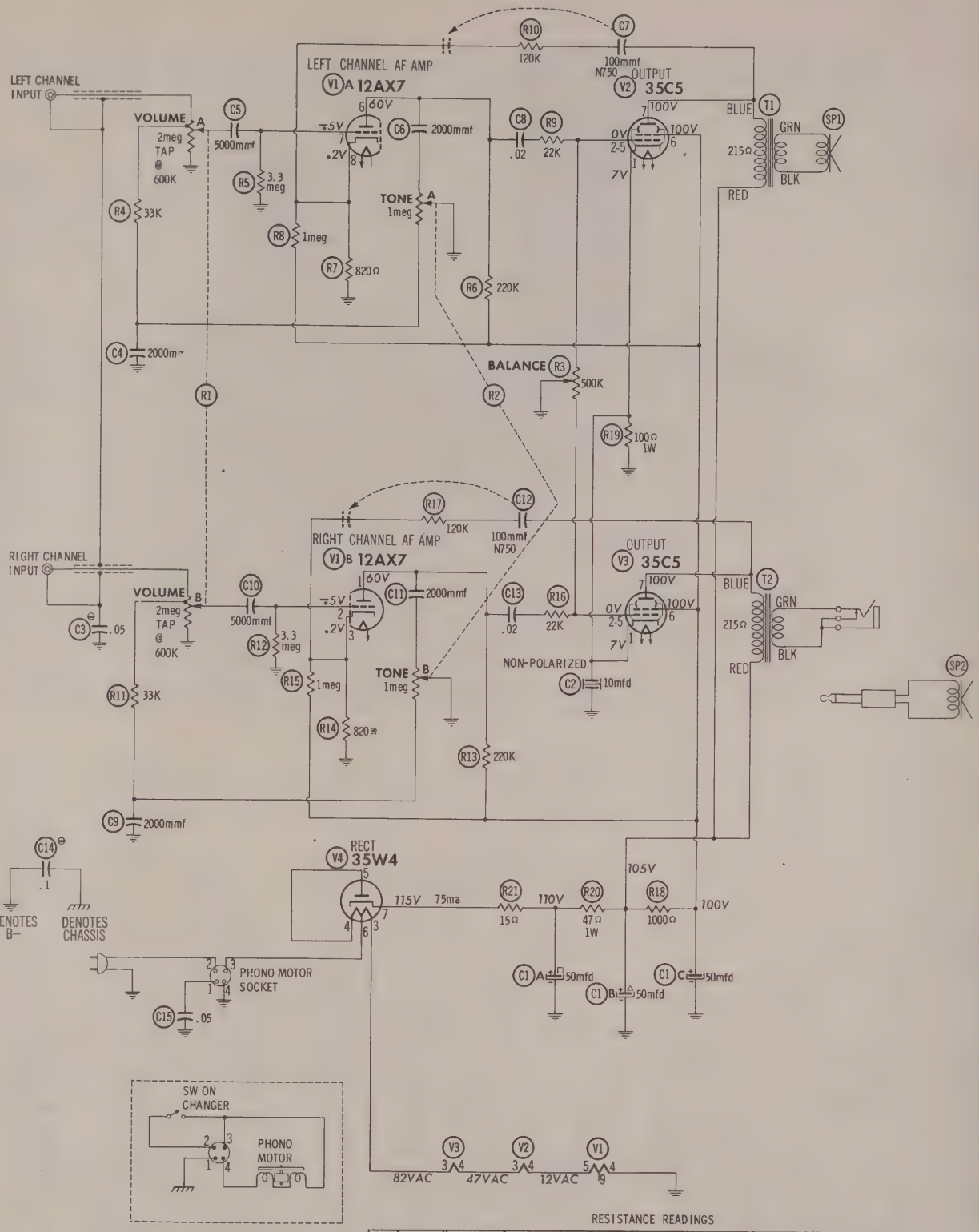
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 36K642338 | Volume, Tone |
| Knob | 36K642399 | Balance |
| Cabinet | 16K642738 | Blue, Model SF11B |
| Cabinet | 16E642737 | Brown, Model SF11N |
| Handle | 55K642986 | |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## CHASSIS—BOTTOM VIEW






RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †220K | 3.3meg | 820Ω | 0Ω | 12Ω | †220K | 3.3meg | 820Ω | 6Ω |
| V2 | 35C5 | 100Ω | 250K | 47Ω | 12Ω | 250K | †1000Ω | †280Ω | | |
| V3 | 35C5 | 100Ω | 250K | 82Ω | 47Ω | 250K | †1000Ω | †280Ω | | |
| V4 | 35W4 | TP | NC | 82Ω | 117Ω | 117Ω | 105Ω | ¶ | | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**MOTOROLA MODELS SF11B, SF11N (Ch. HS-703)**

PHOTOFACT* Folder

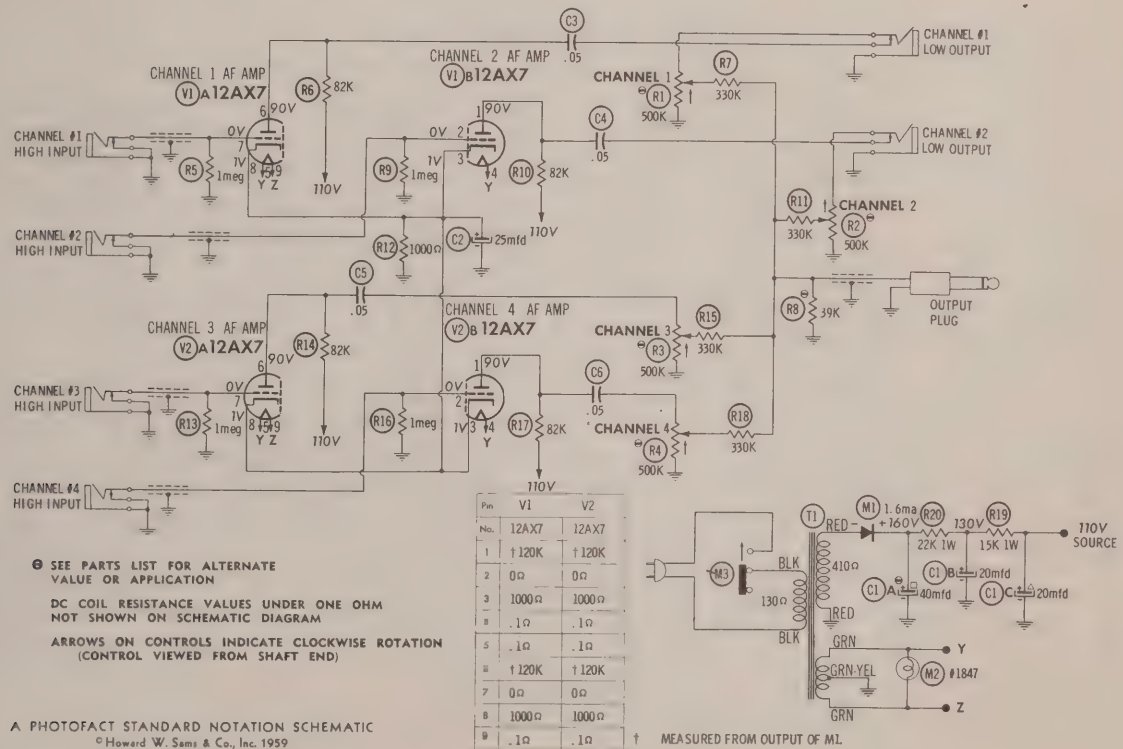
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# PENTRON MODEL CA-14

PENTRON
MODEL CA-14

| | |
|---|---|
| TRADE NAME | Pentron Model CA-14 |
| MANUFACTURER | Pentron Corp., 777 S. Tripp Ave., Chicago 24, Illinois |
| TYPE SET | AC Operated 2 Tube 4 Channel Audio Mixer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 8 Watts, .1 Amp. @ 117 Volts AC |

PENTRON
MODEL CA-14




| Pin No. | V1 12AX7 | V2 12AX7 |
|---|---|---|
| 1 | †120K | †120K |
| 2 | 0Ω | 0Ω |
| 3 | 1000Ω | 1000Ω |
| 4 | .1Ω | .1Ω |
| 5 | .1Ω | .1Ω |
| 6 | †120K | †120K |
| 7 | 0Ω | 0Ω |
| 8 | 1000Ω | 1000Ω |
| 9 | .1Ω | .1Ω |

† MEASURED FROM OUTPUT OF M1.




⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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H992



SET 445 FOLDER 10

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Channel 1-2 AF Amplifier | 12AX7 | |
| V2 | Channel 3-4 AF Amplifier | 12AX7 | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA PENTRON PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ■40 | 150 | ① | AFH3-08 | C0070 | FP311.4 | TMT-7 | TVL-3437 | |
| B | 20 | 150 | | | | | | | |
| C | ▲20 | 150 | | | | | | | |
| C2 | 25 | 25 | | PRS25V25 | BBR25-25 | TC26 | TD-25-25 | TVA-1205 | |

① Some versions may use 20-20-20mfd in this application.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | REPLACEMENT DATA PENTRON PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C3 | .05 | 400 | | | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |
| C4 | .05 | 400 | | | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |
| C5 | .05 | 400 | | | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |
| C6 | .05 | 400 | | | P488N-05 | DF-503 | CUB4S5 | GEM-415 | 4TM-S5 | |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA PENTRON PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | 124-50413-7 | B-60 | A47-500K-Z | Q13-133 | U48 | Channel 1 ① |
| B | Shaft | | | Not Req. | FS-2 | Not Req. | Not Req. | |
| R2A | 500K | ½ | 124-50413-7 | B-60 | A47-500K-Z | Q11-133 | U48 | Channel 2 ① |
| B | Shaft | | | Not Req. | FS-2 | Not Req. | Not Req. | |
| R3A | 500K | ½ | 124-50413-7 | B-60 | A47-500K-Z | Q11-133 | U48 | Channel 3 ① |
| B | Shaft | | | Not Req. | FS-2 | Not Req. | Not Req. | |
| R4A | 500K | ½ | 124-50413-7 | B-60 | A47-500K-Z | Q11-133 | U48 | Channel 4 ① |
| B | Shaft | | | Not Req. | FS-2 | Not Req. | Not Req. | |

① Some versions may use 100K in this application.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | PENTRON PART No. | NOTES |
|---|---|---|---|---|
| R5 | 1meg | | | Note 1 |
| R6 | 82K | | | |
| R7 | 330K | | | |
| R8 | 39K | | | |
| R9 | 1meg | | | |
| R10 | 82K | | | |
| R11 | 330K | | | |
| R12 | 1000Ω | | | |

| ITEM No. | RATING OHMS | RATING WATT | PENTRON PART No. | NOTES |
|---|---|---|---|---|
| R13 | 1meg | | | |
| R14 | 82K | | | |
| R15 | 330K | | | |
| R16 | 1meg | | | |
| R17 | 82K | | | |
| R18 | 330K | | | |
| R19 | 15K | 1 | | |
| R20 | 22K | 1 | | |

Note 1. Some versions may use 100K in this application.

## TRANSFORMER (POWER)

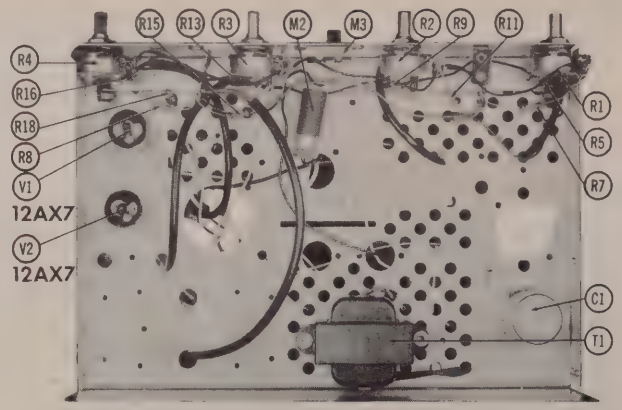
| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA PENTRON PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V | 115V | 6.3VCT | 352-18 | 26R38 ① | P-3045 ① | | PA8421 ① | 26R38 ① | R-30X ① |
| | ② .1A | ② .0016A | ② .73A | | | | | | | |

① Drill new mounting hole.

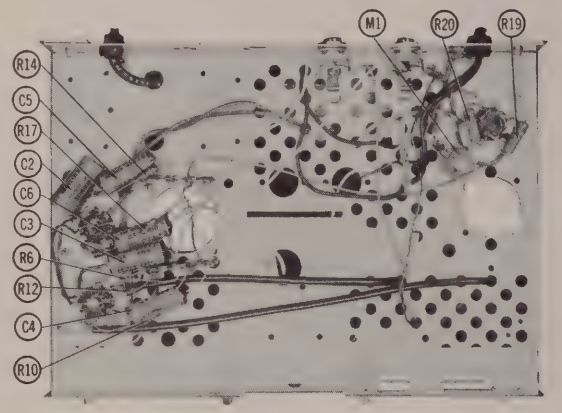
## SELENIUM RECTIFIER

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA PENTRON PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | SARKES TARZIAN PART No. | NOTES |
|---|---|---|---|---|---|---|
| M1 | .0016A | 454-6 | 1159 | D-5410 | 10 | |

## CHASSIS—TOP VIEW




## CHASSIS—BOTTOM VIEW




## MISCELLANEOUS

| ITEM No. | PART NAME | PENTRON PART No. | NOTES |
|---|---|---|---|
| M2 | Lamp | | #1847 |
| M3 | Switch | | Power On-Off (SPST, Slide Type) |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

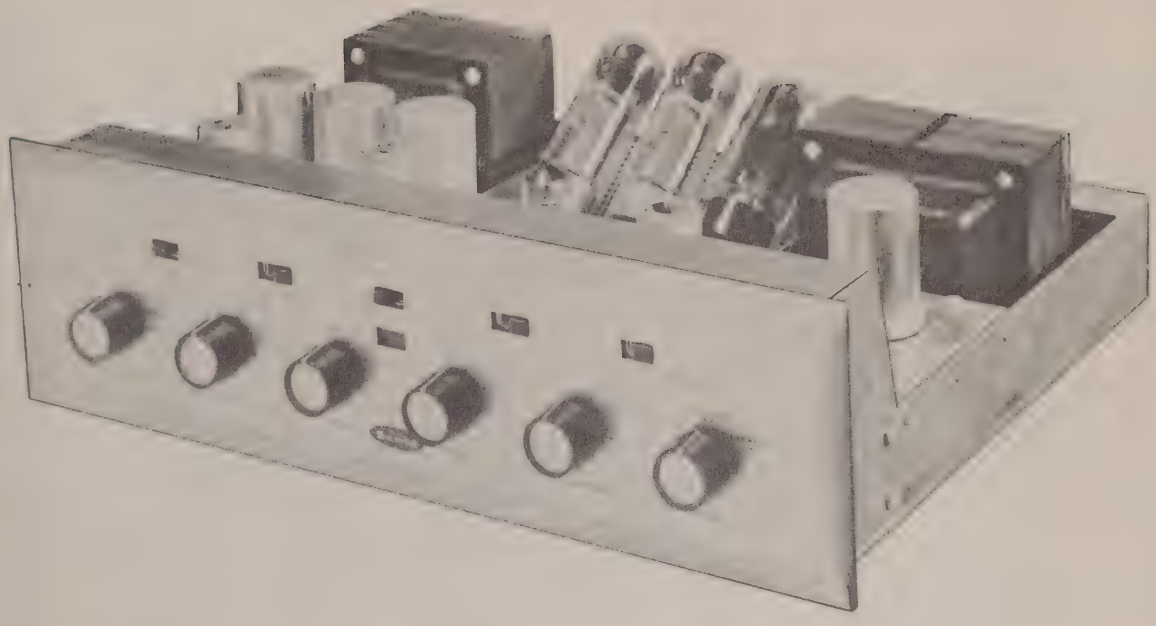
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER

# H. H. SCOTT
# MODEL 209

H. H. SCOTT
MODEL 209



H. H. SCOTT
MODEL 209

| | | | |
|---|---|---|---|
| TRADE NAME | H. H. Scott Model 209 | | |
| MANUFACTURER | Hermon Hosmer Scott, Inc., 111 Powder Mill Road, Maynard, Mass. | | |
| TYPE SET | AC Operated 7 Tube Audio Amplifier | | |
| POWER SUPPLY | 105-125 Volts AC, 50-60 Cycles | RATING | 115 Watts, 1.1 Amp. @ 117 Volts AC |

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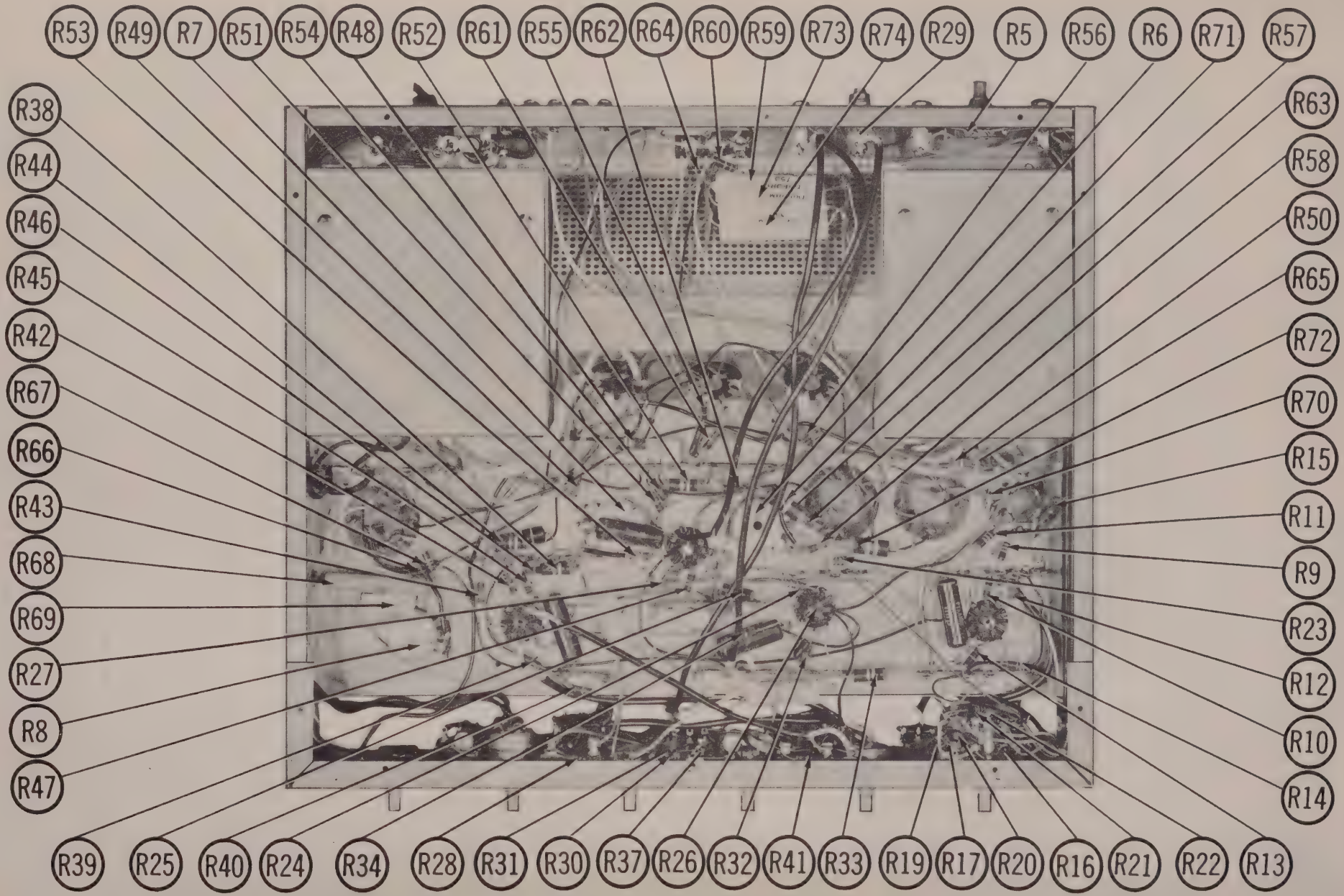
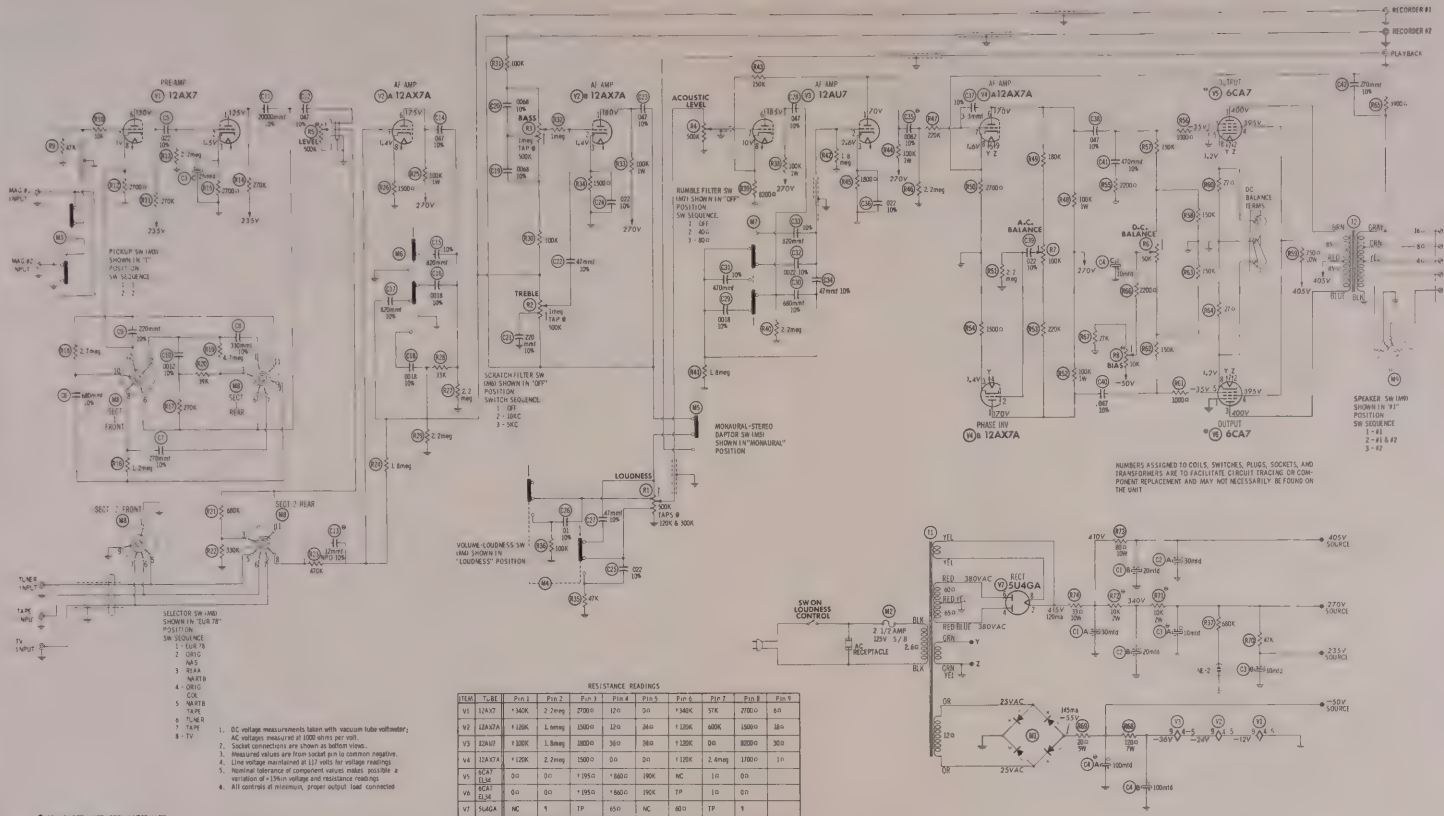
J34




CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION




NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †340K | 2.2meg | 270Ω | 12Ω | 0Ω | †340K | 57K | 270Ω | 6Ω |
| V2 | 12AX7A | †120K | 1.8meg | 150Ω | 12Ω | 24Ω | †120K | 600K | 150Ω | 18Ω |
| V3 | 12AU7 | †100K | 1.8meg | 180Ω | 36Ω | 24Ω | †120K | 0Ω | 820Ω | 30Ω |
| V4 | 12AX7A | †120K | 2.2meg | 150Ω | 0Ω | 0Ω | †120K | 2.4meg | 170Ω | 1Ω |
| V5 | 6CA7 EL34 | 0Ω | 0Ω | †195Ω | †660Ω | 190K | NC | 1Ω | 0Ω | |
| V6 | 6CA7 EL34 | 0Ω | 0Ω | †195Ω | †660Ω | 190K | TP | 1Ω | 0Ω | |
| V7 | 5U4GA | NC | ¶ | TP | 650 | NC | 660 | TP | ¶ | |

ALL MEASUREMENTS TAKEN IN "DUR" POSITION
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V1.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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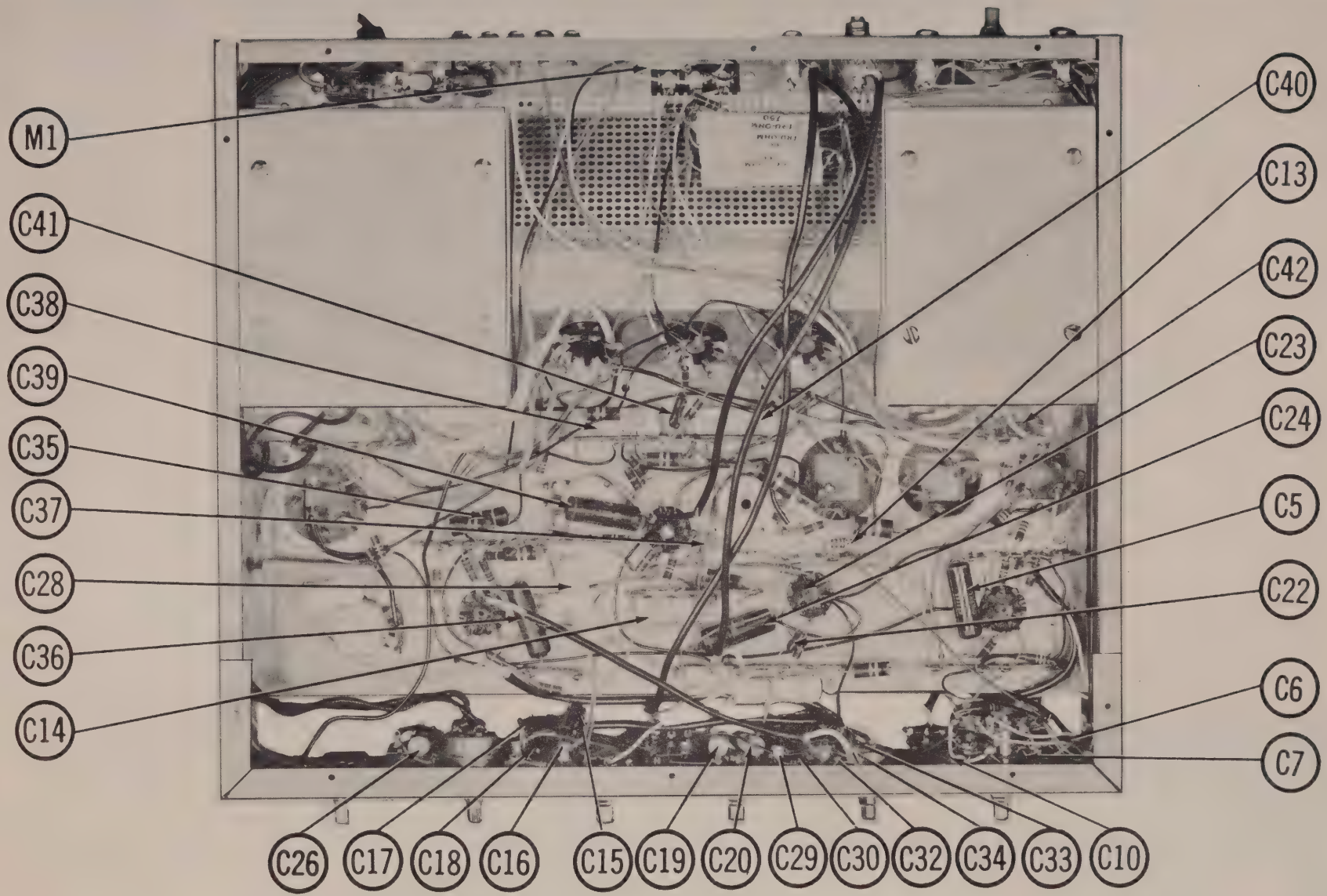
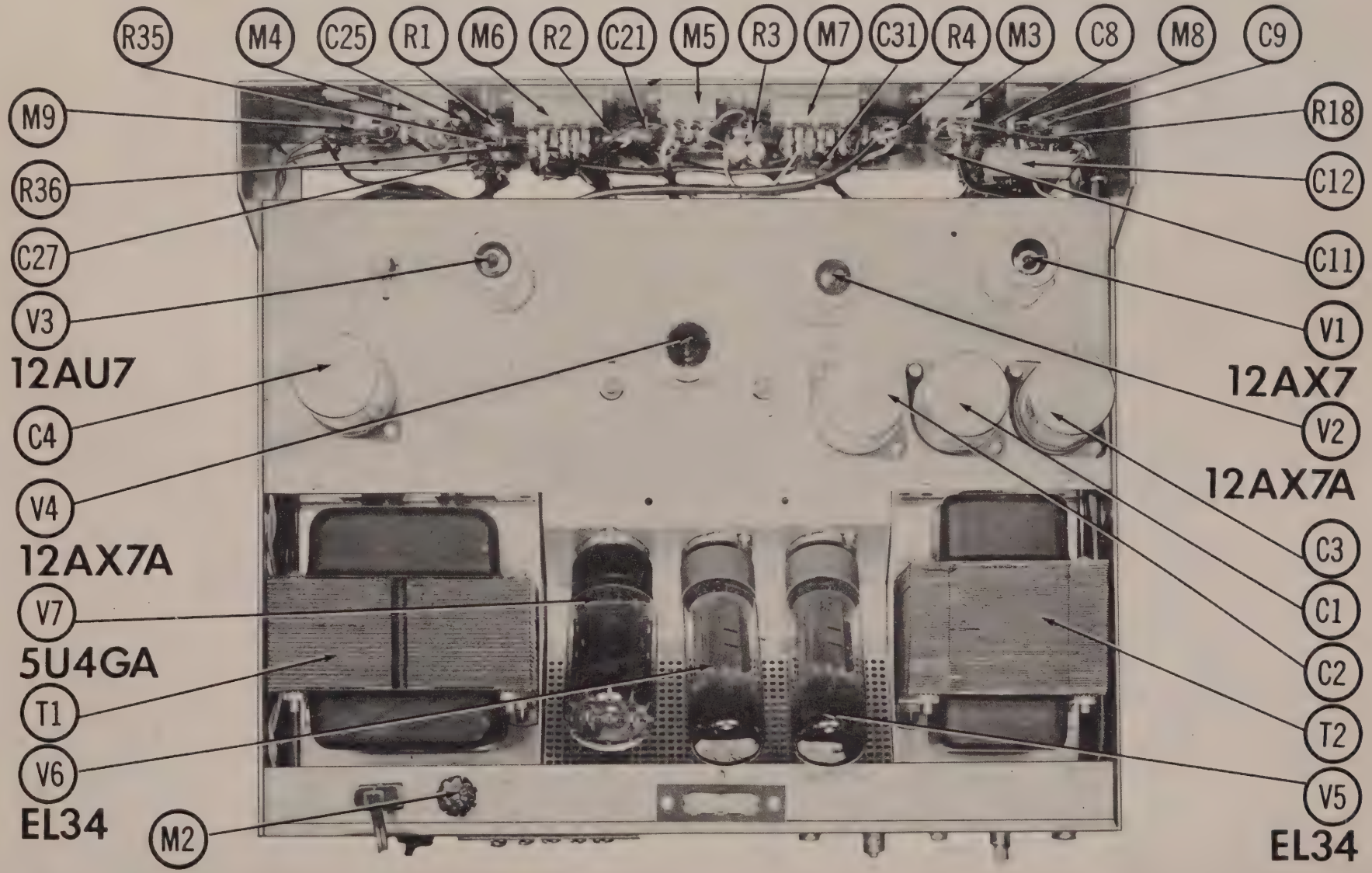
H. H. SCOTT
MODEL 209




CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.




CHASSIS TOP VIEW

# PARTS LIST AND DESCRIPTIONS

## TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Mag Preamplifier | 12AX7 | |
| V2 | AF Amplifier | 12AX7A | |
| V3 | AF Amplifier | 12AU7 | |
| V4 | AF Amp. - Phase Inv. | 12AX7A | |
| V5 | Output | 6CA7/EL34 | |
| V6 | Output | 6CA7/EL34 | |
| V7 | Rectifier | 5U4GA | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | H. H. Scott PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲30 | 475 | CEC-30-20-475 | AFH2-65 | B0486 | FP283 | | TVLS-2826 * | |
| B | ▲20 | 475 | | | BR1250 | TC81 | | | |
| C2A | ▲30 | 475 | CEC-30-20-475 | AFH2-65 | B0486 | FP283 | | TVLS-2826 * | |
| B | ▲20 | 475 | | | BR1250 | TC81 | | | |
| C3A | ■10 | 475 | CEC-2X10-2X25 ① | | D0504 | FP376. 6 | | TVLS-4814.2* | |
| B | ▲10 | 475 | | | | TC26 | | | |
| C | 25 | 25 | | | | | | | |
| D | ▲25 | 25 | ① | | | | | | |
| C4A | ▲100 | 75 | CEC-2X100-10CP② | | | | | TVLS-3360 * | |
| B | ■100 | 75 | | | | | | | |
| C | ▲10 | 75 | | | | | | | |

① C3D is not used. ② Common Positive Unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | H. H. Scott PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C5 | .022 | 400 | 10% | CPM-. 022 | | | | | 5BF-S22 | |
| C6 | 680 | | 10% | CM20-680 | 1469-00068 | D6-681 | 1R5T68 | JL-368 | MS-368 | |
| C7 | 270 | | 10% | CM15-270 | 1469-00027 | D6-271 | 5R5T27 | | MS-327 | |
| C8 | 330 | | 10% | CM15-330 | 1469-00033 | D6-331 | 5R5T33 | JL-333 | MS-333 | |
| C9 | 220 | | 10% | CM15-220 | 1469-00022 | D6-221 | 22R5T22 | | MS-322 | ① |
| C10 | .0012 | 400 | 10% | CPM-. 0012 | | | | | BF-D12 | |
| C11 | 20000 | | 10% | CC-. 02 | | | | | 5GA-S2S 10% * | |
| C12 | .047 | 400 | 10% | CPM-. 047 | | | PM4S47 | | 5BF-S47 | |
| C13 | 12 | | NPO 10% | | NPO-DI 12 | TCZ-12 | C10Q12C | CNO-412 | 5TCC-Q12S 10%* | ② |
| C14 | .047 | 400 | 10% | CPM-. 047 | | | PM4S47 | | 5BF-S47 | |
| C15 | 820 | | 10% | CM20-820 | 1469-00082 | | 1R5T82 | JL-382 | MS-382 | |
| C16 | .0018 | 400 | 10% | CPM-. 0018 | | | | | 5BF-D18 | |
| C17 | 820 | | 10% | CM20-820 | 1469-00082 | | 1R5T82 | JL-382 | MS-382 | |
| C18 | .0018 | 400 | 10% | CPM-. 0018 | | | | | 5BF-D18 | |
| C19 | .0068 | 400 | 10% | CPM-. 0068 | | | PM6D68 | GTM-4268 | 5BF-D68 | |
| C20 | .0068 | 400 | 10% | CPM-. 0068 | | | PM6D68 | GTM-4268 | 5BF-D68 | |
| C21 | 220 | | 10% | CM15-220 | 1469-00022 | D6-221 | 22R5T22 | JL-322 | MS-322 | |
| C22 | 47 | | 10% | CM15-47 | 1469-000047 | D6-470 | 22R5Q47 | CNO-447 | MS-447 | |
| C23 | .047 | 400 | 10% | CPM-. 047 | | | PM4S47 | | 5BF-S47 | |
| C24 | .022 | 400 | 10% | CPM-. 022 | | | PM4S22 | | 5BF-S22 | |
| C25 | .022 | 400 | 10% | CPM-. 022 | | | PM4S22 | | 5BF-S22 | |
| C26 | .01 | 400 | 10% | CPM-. 01 | | | PM4S1 | GEM-1611 | 5BF-S1 | |
| C27 | 47 | | 10% | CM15-47 | 1469-000047 | D6-470 | 22R5Q47 | CNO-447 | MS-447 | |
| C28 | .047 | 400 | 10% | CPM-. 047 | | | PM4S47 | | 5BF-S47 | |
| C29 | .0018 | 400 | 10% | CPM-. 0018 | | | | | 5BF-D18 | |
| C30 | 680 | | 10% | CM20-680 | 1469-00068 | D6-681 | 1R5T68 | JL-368 | MS-368 | |
| C31 | 470 | | 10% | CM20-470 | 1469-00047 | D6-471 | 5R5T47 | JL-347 | MS-347 | |
| C32 | .0022 | 400 | 10% | CPM-. 0022 | | | PM4D22 | | 5BF-D22 | |
| C33 | 820 | | 10% | CM20-820 | 1469-00082 | | 1R5T82 | JL-382 | MS-382 | |
| C34 | 47 | | 10% | CM15-47 | 1469-000047 | D6-470 | 22R5Q47 | CNO-447 | MS-447 | |
| C35 | .0082 | 400 | 10% | CPM-. 0082 | | | | GEM-16282 | 5BF-D82 | ③ |
| C36 | .022 | 400 | 10% | CPM-. 022 | | | PM4S22 | | 5BF-S22 | |
| C37 | 3. 3 | | 10% | CC-3. 3 | NPO-SI 3. 3 | TCZ-3R3 | C10V33C | ZT-5533 | 5TCCB-V33S 10%* | |
| C38 | .047 | 400 | 10% | CPM-. 047 | | | PM4S47 | | 5BF-S47 | |
| C39 | .022 | 400 | 10% | CPM-. 022 | | | PM4S22 | | 5BF-S22 | |

## CAPACITORS (cont)

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | H. H. Scott PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C40 | .047 | 400 | 10% | CPM-. 047 | | | PM4S47 | | 5BF-S47 | |
| C41 | 470 | | 10% | CM20-470 | 1469-00047 | D6-471 | 5R5T47 | JL-347 | MS-347 | |
| C42 | 270 | | 10% | CM15-270 | 1469-00027 | D6-271 | 5R5T27 | | MS-327 | |

① Not used in some versions.
② Some versions may use a 22mmf 10% in this application (Part #CM15-22).
③ Some versions may use a .047 Ⓓ 400V 10% in this application (Part #CPM-. 047).

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | H. H. Scott PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | RCV-500KTT | BT-160 | | Q18-133XX | UDT-283 | Loudness, Tap Ⓓ 120K & 300K |
| B | Switch | | -3RSW | KR-1 | | 76-1 | US-26 | |
| R2A | 1meg | ½ | RCV-1MT-3F | BT-71 | A47F5-1meg | Q19-137X | UT-443 | Treble, Tap Ⓓ 500K |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R3A | 1meg | ½ | RCV-1MT-3F | BT-71 | A47F5-1meg | Q19-137X | UT-443 | Bass, Tap Ⓓ 500K |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R4A | 500K | ½ | RCV-500K-3F | BX-59 | A47-500K-S | Q11-133 | U50 | Acoustic Level |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R5A | 500K | ½ | RCV-500K-3F | BX-59 | A47-500K-S | Q11-133 | U50 | Level Note 1 |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |
| R6A | 50K | ½ | RCV-50K-P | BX-31 | A47-50K-S | Q11-123 | U35 | D. C. Balance |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |
| R7A | 100K | ½ | RCV-100K-P | BX-40 | A47-100K-S | Q11-128 | U41 | A. C. Balance |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |
| R8A | 10K | ½ | RCV-10K-3S | B-14 | A47-10K-S | Q11-116 | U20 | Bias Adjustment Note 2 |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |

Note 1. Some versions may use Part #RCV-500K-P. Note 2. Some versions may use Part #RCV-10K-P.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | H. H. Scott PART No. | NOTES |
|---|---|---|---|---|
| R9 | 47K | | RC21-47K | |
| R10 | 10K | | RC21-10K | |
| R11 | 270K | | RC21-270K | |
| R12 | 2700Ω | | RC21-2. 7K | |
| R13 | 2. 2meg | | RC21-2. 2M | |
| R14 | 270K | | RC21-270K | |
| R15 | 2700Ω | | RC21-2. 7K | |
| R16 | 1. 2meg | | RC21-1. 2M | |
| R17 | 270K | | RC21-270K | |
| R18 | 2. 7meg | | RC21-2. 7M | |
| R19 | 4. 7meg | | RC21-4. 7M | |
| R20 | 39K | | RC21-39K | |
| R21 | 680K | | RC21-680K | |
| R22 | 330K | | RC21-330K | |
| R23 | 470K | | RC21-470K | |
| R24 | 1. 8meg | | RC21-1. 8M | |
| R25 | 100K | 1 | RC31-100K | |
| R26 | 1500Ω | | RC21-1. 5K | |
| R27 | 2. 2meg | | RC21-2. 2M | |
| R28 | 33K | | RC21-33K | |
| R29 | 2. 2meg | | RC21-2. 2M | |
| R30 | 100K | | RC21-100K | |
| R31 | 100K | | RC21-100K | |
| R32 | 1meg | | RC21-1M | |
| R33 | 100K | 1 | RC31-100K | |
| R34 | 1500Ω | | RC21-1. 5K | |
| R35 | 47K | | RC21-47K | |
| R36 | 100K | | RC21-100K | |
| R37 | 680K | | RC21-680K | |
| R38 | 100K | 1 | RC31-100K | |
| R39 | 8200Ω | | RC21-8. 2K | |
| R40 | 2. 2meg | | RC21-2. 2M | |
| R41 | 1. 8meg | | RC21-1. 8M | |
| R42 | 1. 8meg | | RC21-1. 8M | |
| R43 | 150K | | RC21-150K | |
| R44 | 100K | 1 | RC31-100K | |
| R45 | 1800Ω | | RC21-1. 8K | |
| R46 | 2. 2meg | | RC21-2. 2M | |
| R47 | 220K | | RC21-220K | |
| R48 | 100K | 1 | RC31-100K | |
| R49 | 180K | | RC21-180K | |
| R50 | 2700Ω | | RC21-2. 7K | |
| R51 | 2. 2meg | | RC21-2. 2M | |
| R52 | 100K | 1 | RC31-100K | |
| R53 | 220K | | RC21-220K | |
| R54 | 1500Ω | | RC21-1. 5K | |
| R55 | 2200Ω | | RC21-2. 2K | |
| R56 | 1000Ω | | RC21-1K | |
| R57 | 150K | | RC21-150K | |
| R58 | 150K | | RC21-150K | |
| R59 | 750Ω | 10 | RW10-750 | |
| R60 | 27Ω | | RC21-27 | |
| R61 | 1000Ω | | RC21-1K | |
| R62 | 150K | | RC21-150K | |
| R63 | 150K | | RC21-150K | |
| R64 | 27Ω | | RC21-27 | |

# PARTS LIST AND DESCRIPTIONS (cont)

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | H. H. Scott PART No. | NOTES |
|---|---|---|---|---|
| R65 | 3900Ω | | RC21-3.9K | |
| R66 | 2200Ω | | RC21-2.2K | |
| R67 | 27K | | RC21-27K | |
| R68 | 120Ω | 7 | RW7-120 | |
| R69 | 20Ω | 5 | RW5-20 | |
| R70 | 47K | | RC21-47K | |
| R71 | 10K | 2 | RC41-10K | Note 1 |
| R72 | 10K | 2 | RC41-10K | Note 1 |
| R73 | 80Ω | 10 | RW10-80 | |
| R74 | 33Ω | 10 | RW10-33 | |

Note 1. Some versions may use 4700Ω 2W in this application (Part #RC41-4.7K).

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA H. H. Scott PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V @ 1.1A | 760VCT @ .120A | 5V @ 3A | TR-12-3 | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 51V @ .142A | 6.3V @ 3.3A | | | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA H. H. Scott PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 4400Ω CT | 16Ω Tap @ 8Ω, 4Ω | TRA-10-16 | | | | | | | |

## SELENIUM RECTIFIER

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA H. H. Scott PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | SARKES TARZIAN PART No. | NOTES |
|---|---|---|---|---|---|---|
| M1 | .142A | SR-60/150 | | 61-2020 | F2 ① | ① Silicon, 4 used |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA H. H. Scott PART No. FUSE | H. H. Scott PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M2 | 3AG | 2½A 125V S/B | | | 31302.5 (3AG 2½A 125V S/B) | 342012 | MDL2½ | HKP-CC |

## MISCELLANEOUS

| ITEM No. | PART NAME | H. H. Scott PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | SS-22 | Pickup Selector, DPDT (Slide Type) |
| M4 | Switch | SS-22 | Loudness-Volume, DPDT (Slide Type) |
| M5 | Switch | SS-22 | Tape Monitor, DPDT (Slide Type) |
| M6 | Switch | SS-23 | Scratch Filter, DP3T (Slide Type) |
| M7 | Switch | SS-23 | Rumble Filter, DP3T (Slide Type) |
| M8 | Switch | SRW-59 | Input Selector (Rotary Wafer Type) |
| M9 | Switch | SRW-13-6 | Speaker Selector (Rotary Wafer Type) |

# ADJUSTMENTS

### BIAS VOLTAGE AND DC BALANCE ADJUSTMENTS

1. Remove the shorting links on the DC Bal. strip on top of the chassis near the rear apron.
2. Connect a DC voltmeter across the two outside terminals and adjust the DC Balance Control (R6) until the meter reads zero.
3. Connect the DC meter between one of the outside terminals and the center one. Adjust the Bias Adjust Control until the meter reads 1.2 volts. Check the voltage between the center terminal and the other outside terminal to make sure they read the same.
4. Replace the shorting links.

### AC BALANCE ADJUSTMENT

1. Connect the output of an audio generator to the proper input jack.
2. Set all tone controls to their flat position; all rumble and scratch filters including the dynaural, off; and the Loudness Volume switch to Volume.
3. Connect a resistive load to the proper output terminals and connect scope across load. (Make sure ground lead of scope is connected to ground terminal of strip.)
4. Turn all equipment on.
5. If Amplifier is to be used in laboratory at fixed frequency, set generator to that frequency. Otherwise set to 1000 cycles.
6. Increase the output of the generator until the sinewave just begins to clip. With screwdriver, adjust the AC Balance control (R7) until the clipping is even on the top and bottom halves of the cycle. It may be necessary to slightly increase the generator output as the control is adjusted. DO NOT overdrive the amplifier so that most of the sinewave is clipped. This adjustment should be made with as little clipping as possible.
7. If the clipping cannot be made symmetrical, check the output tubes to see if they are seriously unmatched.

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | KN-P-5W | Level Control, Small |
| Knob | KN-R-8W | Front Panel, 5 used |
| Front Panel | N-209-1 | |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

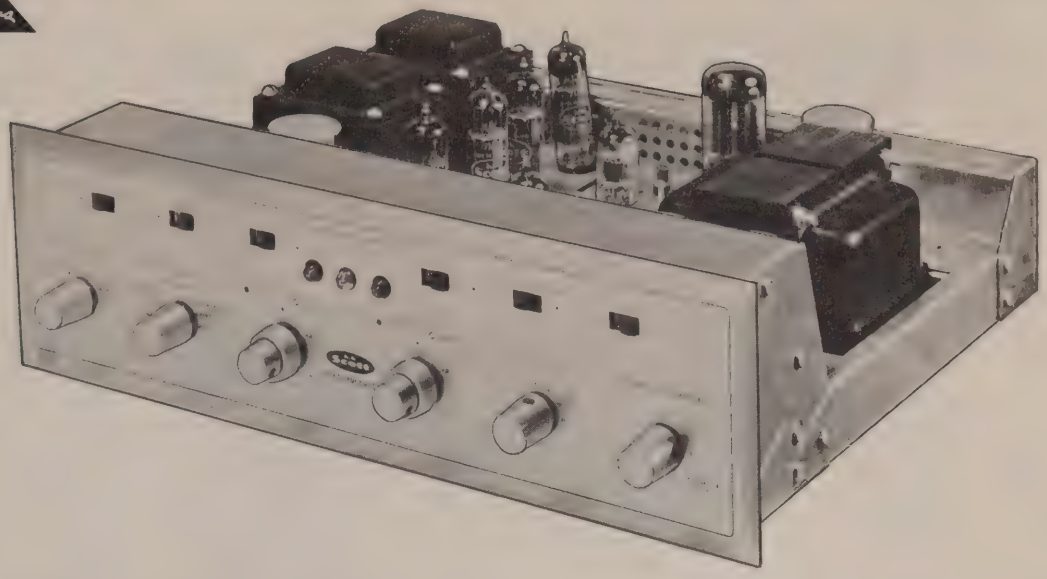
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

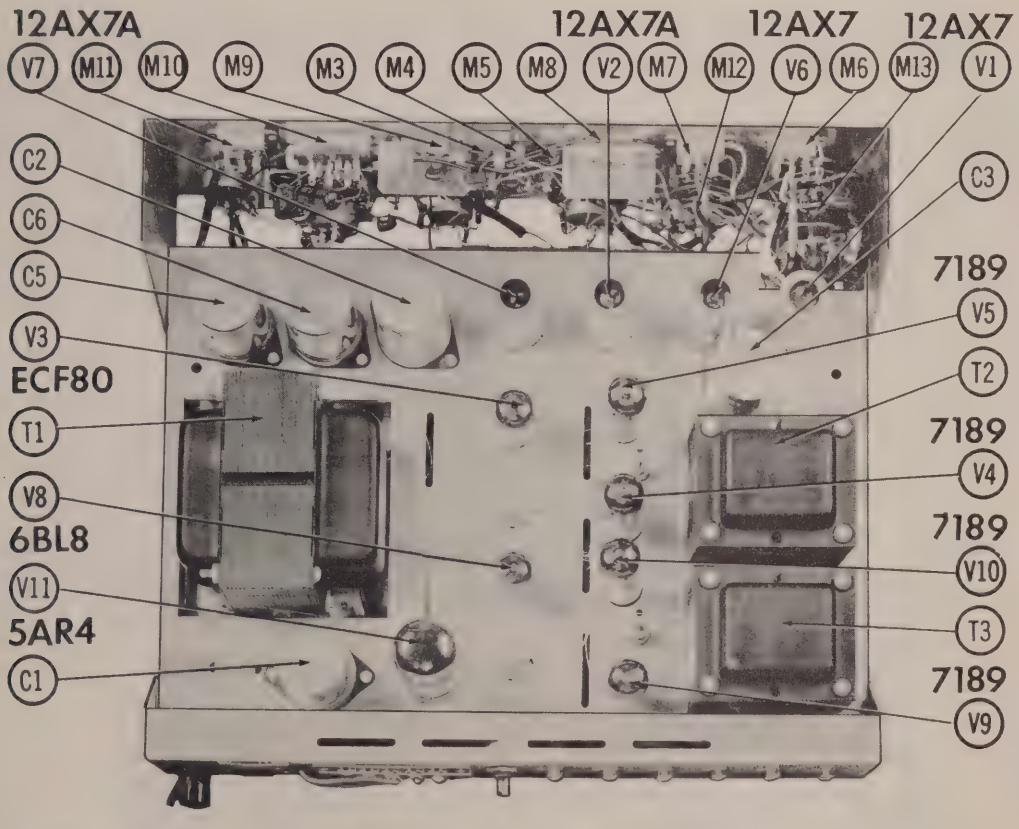
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# H. H. SCOTT
# MODEL 299

H. H. SCOTT
MODEL 299



| | |
|---|---|
| TRADE NAME | H. H. Scott Model 299 |
| MANUFACTURER | Hermon Hosmer Scott, Inc., 111 Powder Mill Road, Maynard, Mass. |
| TYPE SET | AC Operated 11 Tube Stereo Audio Amplifier |
| POWER SUPPLY | 105 - 125 Volts AC, 50-60 Cycles RATING 140 Watts, 1.3 Amp. @117 Volts AC |




H. H. SCOTT
MODEL 299

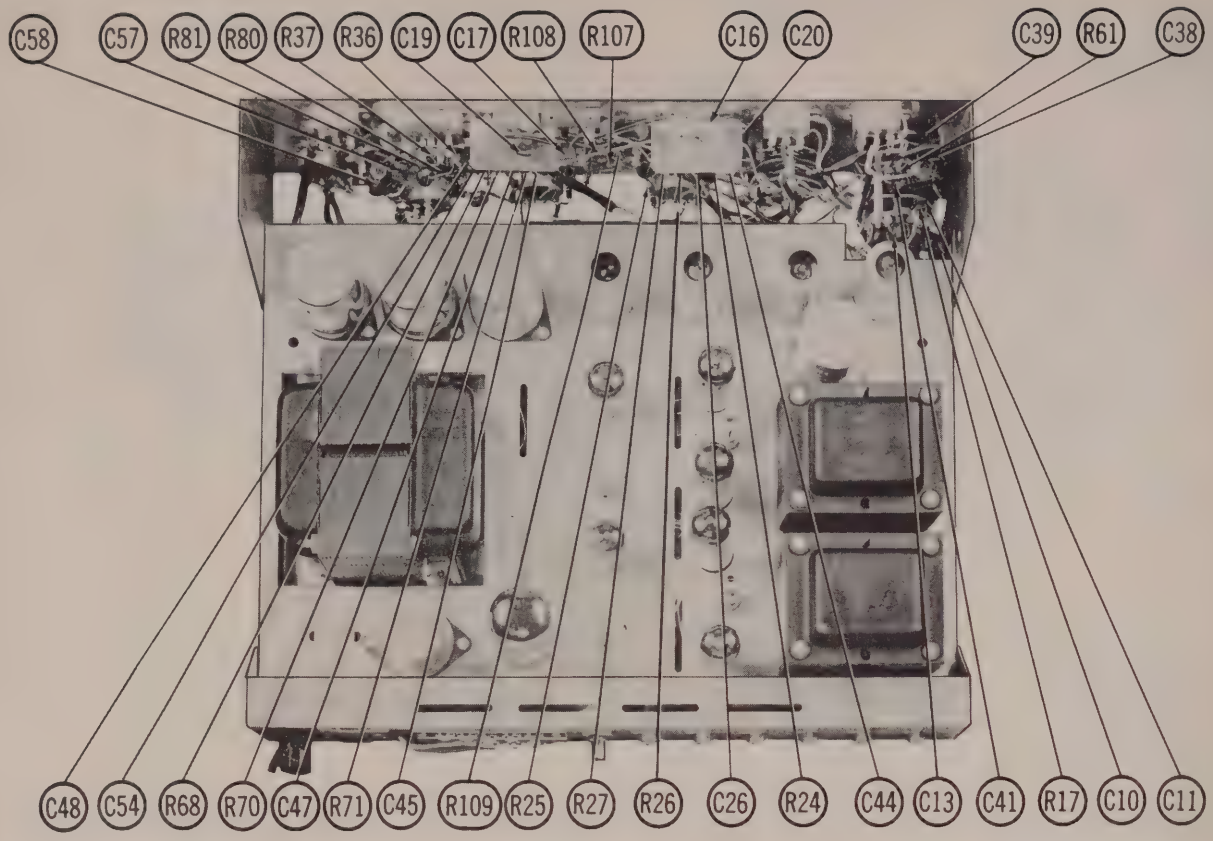
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

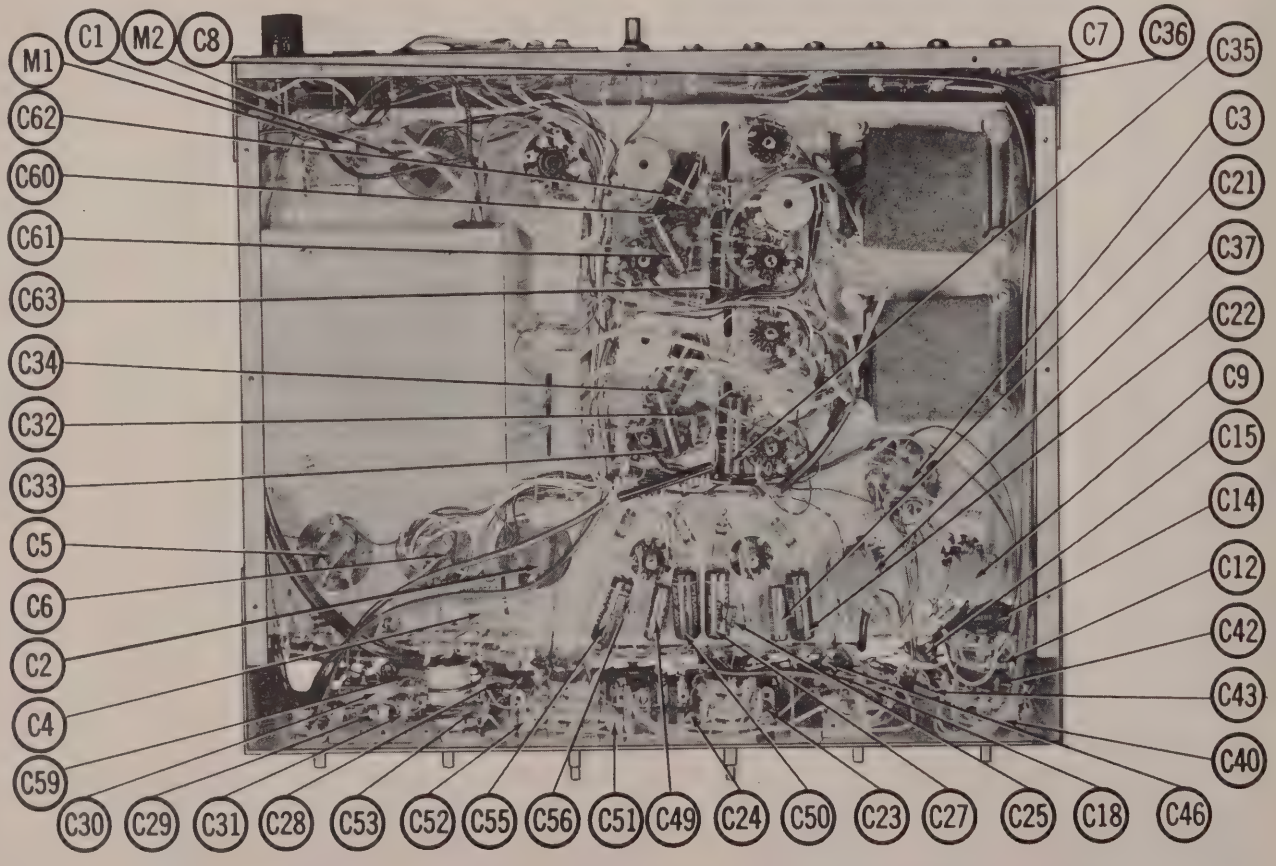
J24



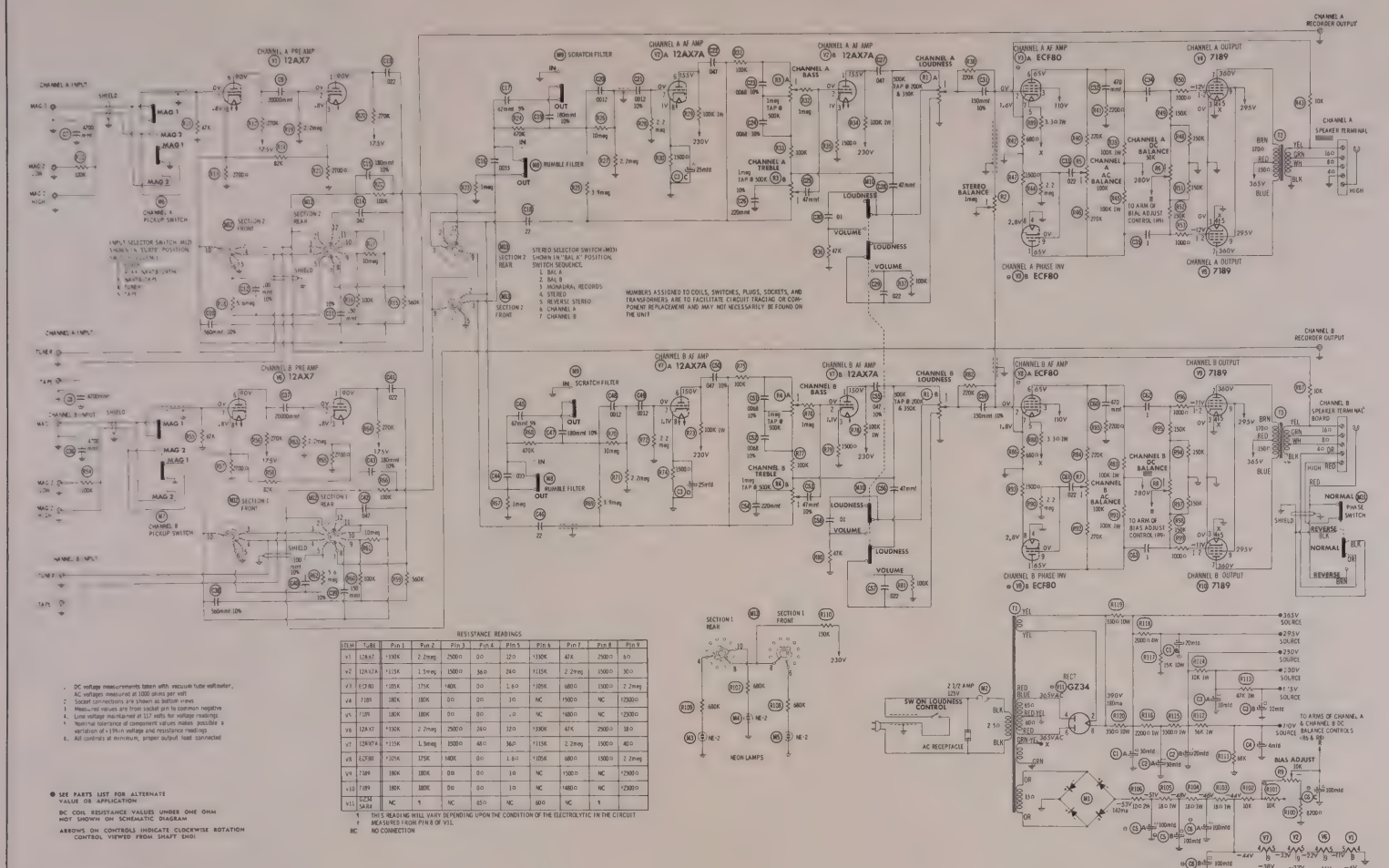
SET 445 FOLDER 12




CHASSIS TOP VIEW - RESISTOR & CAPACITOR IDENT.




CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.


CHANNEL A PRE AMP V1 12AX7
CHANNEL A INPUT
CHANNEL A PICKUP SWITCH
CHANNEL A AF AMP V2A 12AX7A
CHANNEL A AF AMP V2B 12AX7A
SCRATCH FILTER
RUMBLE FILTER
CHANNEL A BASS
CHANNEL A TREBLE
CHANNEL A LOUDNESS
VOLUME
LOUDNESS
STEREO SELECTOR SWITCH (M33) SHOWN IN "BAL A" POSITION.
SWITCH SEQUENCE.
1. BAL A
2. BAL B
3. MONAURAL RECORDS
4. STEREO
5. REVERSE STEREO
6. CHANNEL A
7. CHANNEL B
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
CHANNEL A AF AMP V3A ECF80
CHANNEL A PHASE INV V3B ECF80
CHANNEL A OUTPUT V4 7189
CHANNEL A OUTPUT V5 7189
CHANNEL A RECORDER OUTPUT
CHANNEL A SPEAKER TERMINAL BOARD
STEREO BALANCE
CHANNEL A BALANCE
AC BALANCE
TO ARM OF BIAS ADJUST CONTROL (PH)
CHANNEL B PRE AMP V6 12AX7
CHANNEL B INPUT
CHANNEL B PICKUP SWITCH
CHANNEL B AF AMP V7A 12AX7A
CHANNEL B AF AMP V7B 12AX7A
CHANNEL B BASS
CHANNEL B TREBLE
CHANNEL B LOUDNESS
CHANNEL B AF AMP V8A ECF80
CHANNEL B PHASE INV V8B ECF80
CHANNEL B OUTPUT V9 7189
CHANNEL B OUTPUT V10 7189
CHANNEL B RECORDER OUTPUT
CHANNEL B SPEAKER TERMINAL BOARD
CHANNEL B DC BALANCE
TO ARM OF BIAS ADJUST CONTROL (PH)
SECTION 1 REAR
SECTION 1 FRONT
SECTION 2 REAR
SECTION 2 FRONT
NEON LAMPS
2 1/2 AMP 125V SW ON LOUDNESS CONTROL
AC RECEPTACLE
RECT V11 GZ34
365VAC
365VAC
365V SOURCE
295V SOURCE
230V SOURCE
230V SOURCE
15V SOURCE
10V SOURCE
TO ARMS OF CHANNEL A & CHANNEL B DC SOURCE BALANCE CONTROLS
BIAS ADJUST
H. H. SCOTT MODEL 299

RESISTANCE READINGS

| Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|
| V1 12AX7 | *130K | 2.2meg | 2500Ω | 0Ω | 12Ω | *130K | 47K | 2500Ω | 0Ω |
| V2 12AX7A | *115K | 1.5meg | 1500Ω | 36Ω | 24Ω | *115K | 2.2meg | 1500Ω | 30Ω |
| V3 ECF80 | *205K | 275K | 400K | 0Ω | 1.6Ω | *205K | 680Ω | 1500Ω | 2.2meg |
| V4 7189 | 380K | 380K | 380K | 0Ω | 0Ω | 1Ω | NC | *500Ω | NC *2500Ω |
| V5 7189 | 380K | 380K | 380K | 0Ω | 0Ω | 1Ω | NC | *680Ω | NC *2500Ω |
| V6 12AX7 | *130K | 2.2meg | 2500Ω | 24Ω | 12Ω | *130K | 47K | 2500Ω | 18Ω |
| V7 12AX7A | *115K | 1.5meg | 1500Ω | 48Ω | 36Ω | *115K | 2.2meg | 1500Ω | 40Ω |
| V8 ECF80 | *205K | 275K | 400K | 0Ω | 1.6Ω | *205K | 680Ω | 1500Ω | 2.2meg |
| V9 7189 | 380K | 380K | 380K | 0Ω | 0Ω | 1Ω | NC | *500Ω | NC *2500Ω |
| V10 7189 | 380K | 380K | 380K | 0Ω | 0Ω | 1Ω | NC | *680Ω | NC *2500Ω |
| V11 GZ34 5AR4 | NC | ¶ | NC | 65Ω | NC | 60Ω | NC | ¶ | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
† MEASURED FROM PIN 8 OF V11.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±5% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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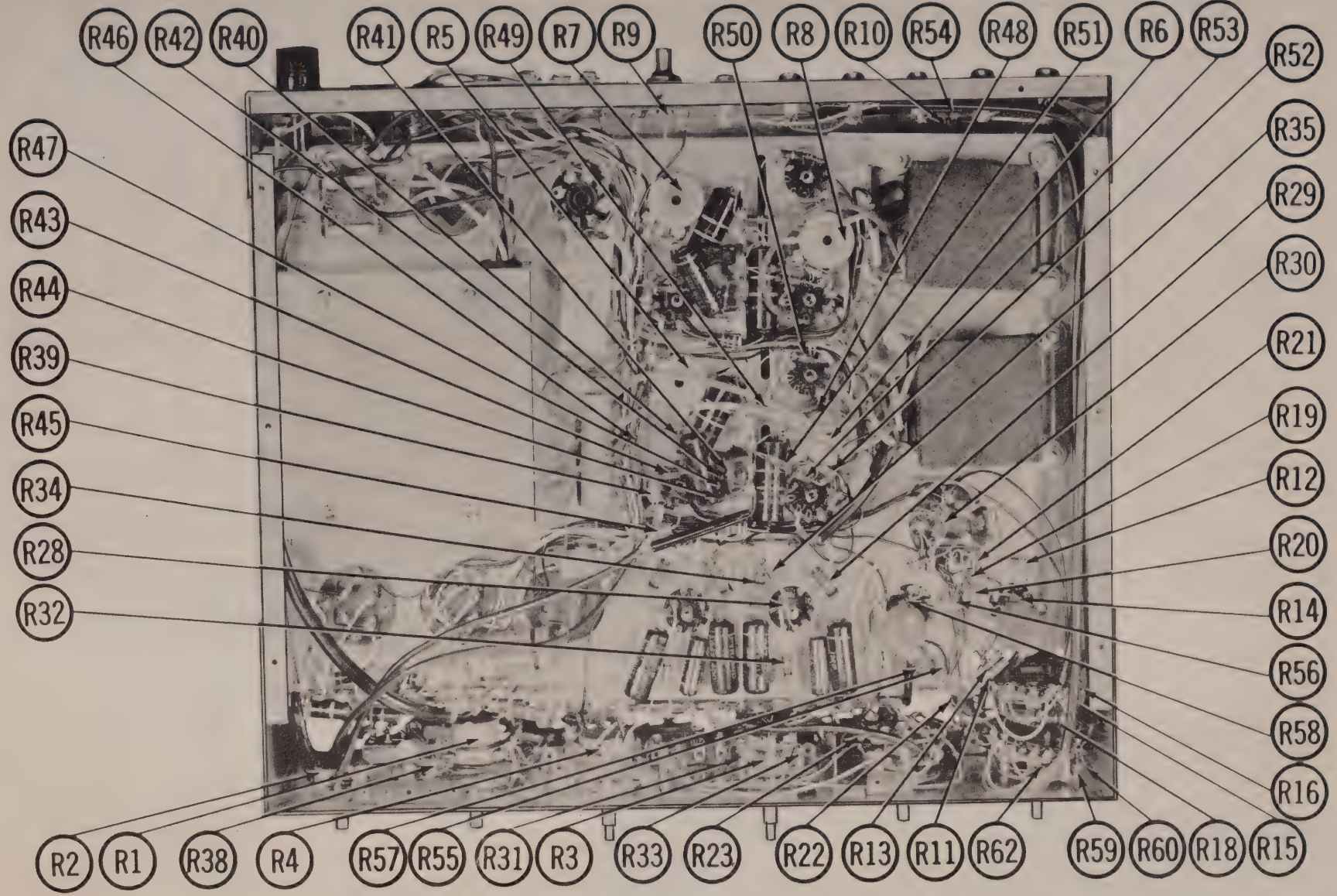
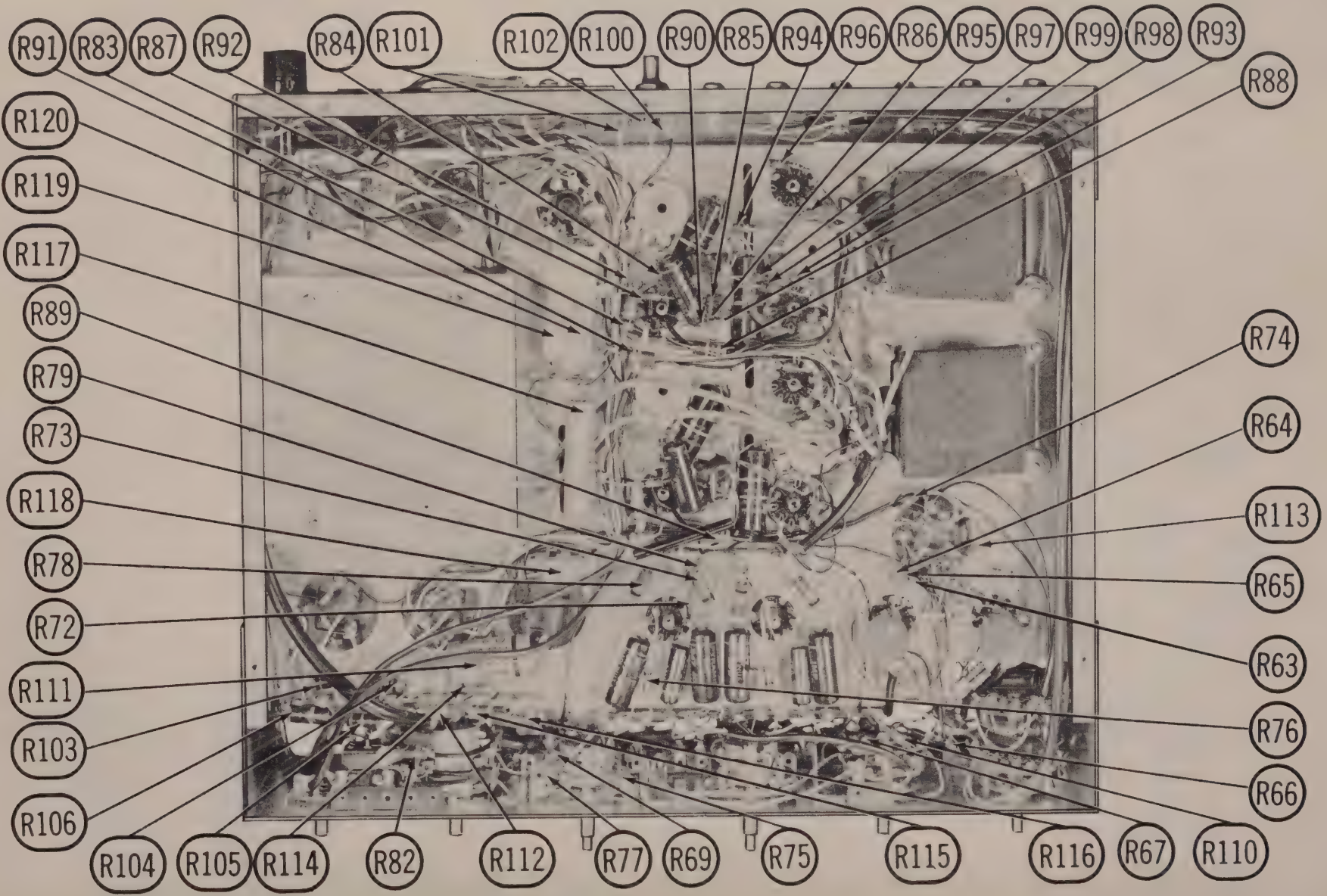



CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R1-R62)




CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R63-R120)

# PARTS LIST AND DESCRIPTIONS

## TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Channel A Preamp. | 12AX7 | |
| V2 | Channel A AF Amp. | 12AX7A | |
| V3 | Channel A AF Amp. – Channel A Phase Inv. | ECF80/ 6BL8 | |
| V4 | Channel A Output | 7189 | |
| V5 | Channel A Output | 7189 | |
| V6 | Channel B Preamp. | 12AX7 | |
| V7 | Channel B AF Amp. | 12AX7A | |
| V8 | Channel B AF Amp. – Channel B Phase Inv. | ECF80/ 6BL8 | |
| V9 | Channel B Output | 7189 | |
| V10 | Channel B Output | 7189 | |
| V11 | Rectifier | GZ34/ 5AR4 | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA H. H. SCOTT PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲30 | 475 | CEC-30-20-475 | AFH2-65 | B0486 | FP283 | | TVLS-2826* | |
| B | ▲20 | 475 | | | BR1250 | TC81 | | | |
| C2A | ▲30 | 475 | CEC-30-20-475 | AFH2-65 | B0486 | FP283 | | TVLS-2826* | |
| B | ▲20 | 475 | | | BR1250 | TC81 | | | |
| C3A | ▲10 | 450 | CEC-2X10-2X25 | AFH4-63 | D0880 | FP376.6 | TMQ-72 | TVL-4711.6 | |
| B | ■10 | 450 | | | | TC26 | | | |
| C | ▲25 | 25 | | | | | | | |
| D | 25 | 25 | | | | | | | |
| C4 | 4 | 250 | CET4/250 | PRS250V4 | BBR4-250 | TC50X | TD-4-250 | TVA-1501 | |
| C5A | ▲100 | 75 | CEC-2X100-10CP① | | | | | TVLS-3360* | |
| B | ■100 | 75 | | | | | | | |
| C | ▲10 | 75 | ② | | | | | | |
| C6A | ▲100 | 75 | CEC-2X100-10CP① | | | | | TVLS-3360* | |
| B | ■100 | 75 | | | | | | | |
| C | ▲10 | 75 | | | | | | | |

① Common Positive Unit ② C5C is not used

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | REPLACEMENT DATA H. H. SCOTT PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C7 | 4700 | | | | BPD-0047 | DD-472 | BYA10D47M | B-247 | 5HK-D47 | |
| C8 | 4700 | | | | BPD-0047 | DD-472 | BYA10D47M | B-247 | 5HK-D47 | |
| C9 | 20000 | | | | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C10 | 560 | | 10% | | 1464-00056 | | 1R5T56 | | MS-356 | |
| C11 | 150 | | 10% | | 1469-00015 | | 22R5T15 | MCB236 | MS-315 | |
| C12 | 100 | | 10% | | 1469-0001 | | 22R5T1 | MCB235 | MS-31 | |
| C13 | .022 | 400 | | | P488N-022 | DD-203 | CUB4S22 | GEM-4122 | 4TM-S22 | |
| C14 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C15 | 180 | | 10% | | 1469-00018 | | 22R5T18 | | MS-318 | |
| C16 | .0033 | 400 | | | P488N-0033 | D6-332 | CUB6D33 | GEM-6233 | 6TM-D33 | |
| C17 | 62 | | 5% | | 1469-000062 | | 22R5Q62 | | MS-462 | |
| C18 | .22 | | | | | | | | | |
| C19 | 180 | | 10% | | 1469-00018 | | 22R5T18 | | MS-318 | |
| C20 | .0012 | 400 | | | P488N-001 | D6-122 | CUB6D1 | GEM-421 | 6TM-D1 | |
| C21 | .0012 | 400 | 10% | | | | | | 6TM-D1S 10%* | |
| C22 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C23 | .0068 | 400 | 10% | | | | | GEM-16268 | 6TM-D68S 10%* | |
| C24 | .0068 | 400 | 10% | | | | | GEM-16268 | 6TM-D68S 10%* | |
| C25 | 47 | | | | 1468-000047 | D6-470 | 5W5Q47 | | 1FM-447 | |
| C26 | 220 | | 10% | | 1469-00022 | | 22R5T22 | | MS-322 | |
| C27 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C28 | 47 | | | | 1468-000047 | D6-470 | 5W5Q47 | | 1FM-447 | |
| C29 | .022 | 400 | | | P488N-022 | DD-203 | CUB4S22 | GEM-4122 | 4TM-S22 | |
| C30 | .01 | 400 | | | P488N-01 | D6-103 | CUB4S1 | GEM-411 | 4TM-S1 | |
| C31 | 150 | | 10% | | 1469-00015 | | 22R5T15 | MCB236 | MS-315 | |
| C32 | 470 | | | | 1468-00047 | D6-471 | 5W5T47 | | 1FM-347 | |
| C33 | .022 | 400 | | | P488N-022 | DD-203 | CUB4S22 | GEM-4122 | 4TM-S22 | |
| C34 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C35 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C36 | 4700 | | | | BPD-0047 | DD-472 | BYA10D47M | B-247 | 5HK-D47 | |
| C37 | 20000 | | | | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C38 | 560 | | 10% | | 1464-00056 | | 1R5T56 | | MS-356 | |
| C39 | 150 | | 10% | | 1469-00015 | | 22R5T15 | MCB236 | MS-315 | |
| C40 | 100 | | 10% | | 1469-0001 | | 22R5T1 | MCB235 | MS-31 | |

## CAPACITORS (cont)

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | REPLACEMENT DATA H. H. SCOTT PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C41 | .022 | 400 | | | P488N-022 | D6-203 | CUB4S22 | GEM-4122 | 4TM-S22 | |
| C42 | .047 | 400 | | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C43 | 180 | | 10% | | 1469-00018 | | 22R5T18 | | MS-318 | |
| C44 | .033 | 400 | | | P488N-033 | DF-303 | CUB4S33 | GEM-4133 | 4TM-S33 | |
| C45 | 62 | | 5% | | 1469-000062 | | 22R5Q62 | | MS-462 | |
| C46 | .22 | | | | | | | | | |
| C47 | 180 | | 10% | | 1469-00018 | | 22R5T18 | | MS-318 | |
| C48 | .0012 | 400 | | | P488N-001 | D6-122 | CUB6D1 | GEM-421 | 6TM-D1 | |
| C49 | .0012 | 400 | 10% | | | | | | 6TM-D1S 10%* | |
| C50 | .047 | 400 | 10% | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C51 | .0068 | 400 | 10% | | | | | GEM-16268 | 6TM-D68S 10%* | |
| C52 | .0068 | 400 | 10% | | | | | GEM-16268 | 6TM-D68S 10%* | |
| C53 | 47 | | 10% | | 1468-000047 | D6-470 | 5W5Q47 | | 1FM-447 | |
| C54 | 220 | | 10% | | 1469-00022 | | 22R5T22 | | MS-322 | |
| C55 | .047 | 400 | 10% | | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C56 | 47 | | | | 1468-000047 | D6-470 | 5W5Q47 | | 1FM-447 | |
| C57 | .022 | 400 | | | P488N-022 | DD-203 | CUB4S22 | GEM-4122 | 4TM-S22 | |
| C58 | .01 | 400 | | | P488N-01 | D6-103 | CUB4S1 | GEM-411 | 4TM-S1 | |
| C59 | 150 | | 10% | | 1469-00015 | | 22R5T15 | MCB236 | MS-315 | |
| C60 | 470 | | | | 1468-00047 | D6-471 | 5W5T47 | | 1FM-347 | |
| C61 | .022 | 400 | | | P488N-022 | DD-203 | CUB4S22 | GEM-4122 | 4TM-S22 | |
| C62 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |
| C63 | .1 | 400 | | | P488N-1 | DF-104 | CUB4P1 | GEM-401 | 4TM-P1 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA H. H. SCOTT PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | RCVD-500K-TT-3F-SW | | | | | Loudness, Chan. A. Tap |
| B | 500K | ½ | | | | | | Loundess, Chan. B. Tap |
| C | Switch | | | | | | | Off/On |
| R2A | 1meg | ½ | RCV-1MT-3F | BT-71 | A47 F5-1meg | Q19-137X | UT443 | Stereo Balance. Tap @ 500K |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R3A | 1meg | ½ | RCVC-1MT | F1-56 | | | † | Bass, Chan. A. Tap @ 500K |
| B | 1meg | ½ | | R2-56 | | | | Treble, Chan. A. Tap @ 500K |
| R4A | 1meg | ½ | RCVC-1MT | R2-56 | | | † | Bass, Chan. B. Tap @ 500K |
| B | 1meg | ½ | | R1-56 | | | | Treble, Chan. B. Tap @ 500K |
| R5A | 100K | ½ | RCV-100K-P | BX-40 | A47-100K-S | Q11-128 | U41 | AC Balance, Chan. A. |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |
| R6A | 50K | ½ | RCV-50K-P | BX-31 | A47-50K-S | Q11-123 | U35 | DC Balance, Chan. A |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |
| R7A | 100K | ½ | RCV-100K-P | BX-40 | A47-100K-S | Q11-128 | U41 | AC Balance, Chan. B |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |
| R8A | 50K | ½ | RCV-50K-P | BX-31 | A47-50K-S | Q11-123 | U35 | DC Balance, Chan. B |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |
| R9A | 10K | ½ | RCV-10K-3S | B-14 | A47-10K-S | Q11-116 | U20 | Bias Adjust |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | |

† "STA-LOC" Equivalent: FB16T55, RU16T55, CS-3500

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | H. H. SCOTT PART No. | NOTES |
|---|---|---|---|---|
| R10 | 100K | | | |
| R11 | 47K | | | |
| R12 | 270K | | | |
| R13 | 2700Ω | | | |
| R14 | 82K | | | |
| R15 | 560K | | | |
| R16 | 100K | | | |
| R17 | 10meg | | | |
| R18 | 5.6meg | | | |
| R19 | 2.2meg | | | |
| R20 | 270K | | | |
| R21 | 2700Ω | | | |
| R22 | 100K | | | |
| R23 | 1meg | | | |
| R24 | 470K | | | |
| R25 | 3.9meg | | | |
| R26 | 10meg | | | |
| R27 | 2.2meg | | | |
| R28 | 2.2meg | | | |
| R29 | 100K | 1 | | |
| R30 | 1500Ω | | | |
| R31 | 100K | | | |
| R32 | 1meg | | | |
| R33 | 100K | | | |
| R34 | 100K | 1 | | |
| R35 | 1500Ω | | | |

# PARTS LIST AND DESCRIPTIONS (cont)

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | H. H. SCOTT PART No. | NOTES |
|---|---|---|---|---|
| R36 | 47K | | | |
| R37 | 100K | | | |
| R38 | 220K | | | |
| R39 | 100K | 1 | | |
| R40 | 220K | | | |
| R41 | 2200Ω | | | |
| R42 | 680Ω | | | |
| R43 | 10K | | | |
| R44 | 2.2meg | | | |
| R45 | 100K | 1 | | |
| R46 | 270K | | | |
| R47 | 1500Ω | | | |
| R48 | 150K | | | |
| R49 | 150K | | | |
| R50 | 1000Ω | | | |
| R51 | 150K | | | |
| R52 | 150K | | | |
| R53 | 1000Ω | | | |
| R54 | 100K | | | |
| R55 | 47K | | | |
| R56 | 270K | | | |
| R57 | 2700Ω | | | |
| R58 | 82K | | | |
| R59 | 560K | | | |
| R60 | 100K | | | |
| R61 | 10meg | | | |
| R62 | 5.6meg | | | |
| R63 | 2.2meg | | | |
| R64 | 270K | | | |
| R65 | 2700Ω | | | |
| R66 | 100K | | | |
| R67 | 1meg | | | |
| R68 | 470K | | | |
| R69 | 3.9meg | | | |
| R70 | 10meg | | | |
| R71 | 2.2meg | | | |
| R72 | 2.2meg | | | |
| R73 | 100K | 1 | | |
| R74 | 1500Ω | | | |
| R75 | 100K | | | |
| R76 | 1meg | | | |
| R77 | 100K | | | |
| R78 | 100K | 1 | | |
| R79 | 1500Ω | | | |
| R80 | 47K | | | |
| R81 | 100K | | | |
| R82 | 220K | | | |
| R83 | 100K | 1 | | |
| R84 | 220K | | | |
| R85 | 2200Ω | | | |
| R86 | 680Ω | | | |
| R87 | 10K | | | |
| R88 | 3.3Ω | 1 | | |
| R89 | 3.3Ω | 1 | | |
| R90 | 2.2meg | | | |
| R91 | 100K | 1 | | |
| R92 | 270K | | | |
| R93 | 1500Ω | | | |
| R94 | 150K | | | |
| R95 | 150K | | | |
| R96 | 1000Ω | | | |
| R97 | 150K | | | |
| R98 | 150K | | | |
| R99 | 1000Ω | | | |
| R100 | 8200Ω | | | |
| R101 | 10K | | | Note 1 |
| R102 | 10K | | | |
| R103 | 18Ω | 1 | | |
| R104 | 18Ω | 1 | | |
| R105 | 18Ω | 1 | | |
| R106 | 10Ω | 2 | | |
| R107 | 680K | | | |
| R108 | 680K | | | |
| R109 | 680K | | | |
| R110 | 150K | | | |
| R111 | 68K | | | |
| R112 | 56K | 1 | | |
| R113 | 47K | 1 | | |
| R114 | 10K | 1 | | |
| R115 | 3300Ω | 1 | | |
| R116 | 2200Ω | 1 | | |
| R117 | 15K | 10 | | |
| R118 | 2000Ω | 4 | | |
| R119 | 330Ω | 10 | | |
| R120 | 330Ω | 10 | | |

① Not used in some versions.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA H. H. SCOTT PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V ⓐ 1.3V | 730 VCT ⓐ .180A | 5V ⓐ 3A | | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 51V ⓐ .142A | 6.3V ⓐ 3.5A | | | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA H. H. SCOTT PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 7000Ω CT | 16Ω Tap ⓐ 8Ω, 4Ω | TRA-8-3 | | | | | | | |
| T3 | 7000Ω CT | 16Ω Tap ⓐ 8Ω, 4Ω | TRA-8-3 | | | | | | | |

## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA H. H. SCOTT PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | SARKES TARZIAN PART No. | NOTES |
|---|---|---|---|---|---|---|
| M1 | .142A | | HA151①② | SD-92① ② | F2①② | ① Silicon Type ② 4 Required |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA H. H. SCOTT PART No. FUSE | H. H. SCOTT PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M2 | 3AG | 2½A 125V S/B | | | 31302.5 (2½A 125V S/B) | 342012 | MDL 2½ | HKP-CC |

## MISCELLANEOUS

| ITEM No. | PART NAME | H. H. SCOTT PART No. | NOTES |
|---|---|---|---|
| M3 | Lamp | | NE-2 |
| M4 | Lamp | | NE-2 |
| M5 | Lamp | | NE-2 |
| M6 | Switch | | Pickup A (DPDT, Slide Type) |
| M7 | Switch | | Pickup B (DPDT, Slide Type) |
| M8 | Switch | | Rumble Filter In-Out (DPDT, Slide Type) |
| M9 | Switch | | Scratch Filter (DPDT Slide Type) |
| M10 | Switch | | Loudness-Volume, Ganged (DPDT, Slide Type) |
| M11 | Switch | | Phase Normal-Reverse (DPDT, Slide Type) |
| M12 | Switch | | Input Selector (5 Position, Rotary Wafer Type) |
| M13 | Switch | | Stereo Selector (7 Position, Rotary Wafer Type) |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

### BIAS ADJUSTMENT (R9)

Connect D.C. VTVM across R120. Adjust Bias control (R9) for 24.5 volts on VTVM.

### D.C. BALANCE ADJUSTMENTS (R6) (R8)

Connect DC voltmeter (with a MINIMUM 1 volt scale) from pin 7 (plate) of 7189 (V4) to pin 7 (plate) of 7189 (V5).

Adjust D.C. Balance control (R6) for MINIMUM deflection. Connect the voltmeter from pin 7 (plate) of 7189 (V9) to pin 7 (plate) of 7189 (V10). Adjust R8 for MINIMUM deflection.

### AC BALANCE ADJUSTMENTS (R5) (R7)

Turn function switch to Stereo position, set tone controls to Flat, Rumble and Scratch Filters to Off, and Loudness-Volume control to Volume.

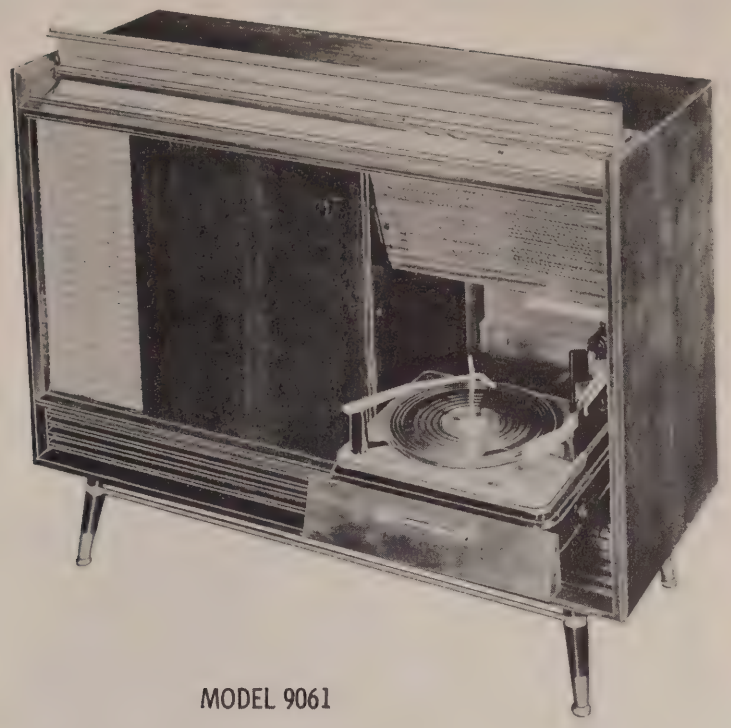
Connect a 16Ω, 40 watt resistor between "0" and "16Ω" terminals of Channel A output transformer secondary. Connect a scope across the resistor. Connect a sine-wave audio oscillator to the Mag 1 jack of Channel A. Increase the oscillator output until the sine-wave just begins to clip. Adjust R5 until clipping is symmetrical. (Equal amounts are clipped from top and bottom of wave peaks).

Remove the oscillator, resistor and scope from Channel A, and connect to similar points on Channel B. Repeat procedure, adjusting R7 for symmetrical clipping.

PHOTOFACT* Folder

# SILVERTONE MODELS 9061, 9062 (Ch. 528.53380)

SILVERTONE MODELS 9061, 9062 (Ch. 528.53380)

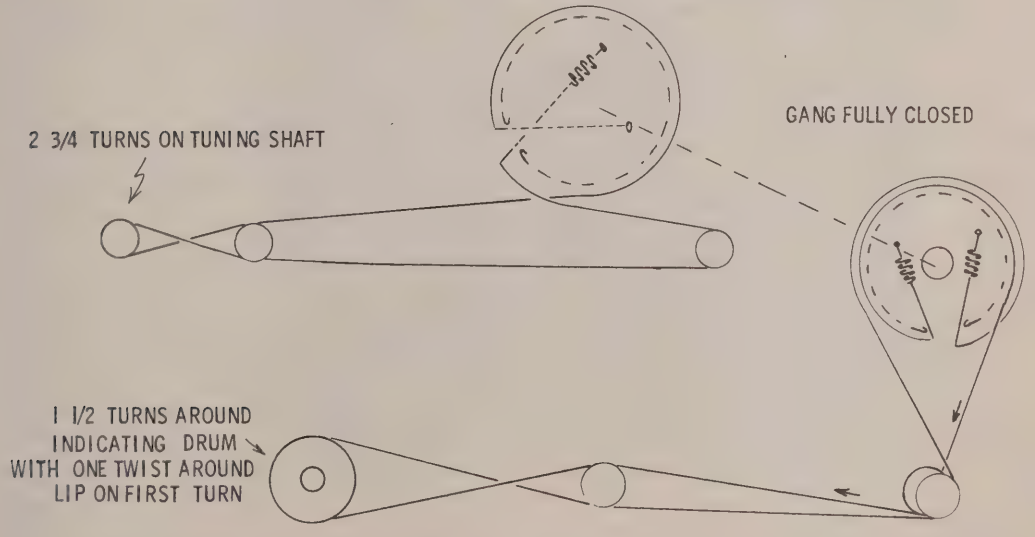


MODEL 9061

| | | | |
|---|---|---|---|
| TRADE NAME | Silvertone Models 9061, 9062 (Ch. 528.53380) | | |
| SUPPLIER | Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois | | |
| TYPE SET | AC Operated 15 Tube, FM-AM Receiver With 4 Speed Automatic Record Changer | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles | RATING | 132 Watts, 1.25 Amp. @ 117 Volts AC (Less Motor) |
| TUNING RANGE | BROADCAST 535 - 1620KC | FREQ. MOD. | 88 - 108MC |

FOR SERVICE INFORMATION ON RECORD CHANGER 528.56500 OR 528.56510 - SEE SIMILAR SILVERTONE 528.56310 - PHOTOFACT SET 417 FOLDER 10

## DRIVE CORD STRINGING




SILVERTONE MODELS 9061, 9062 (Ch. 528.53380)

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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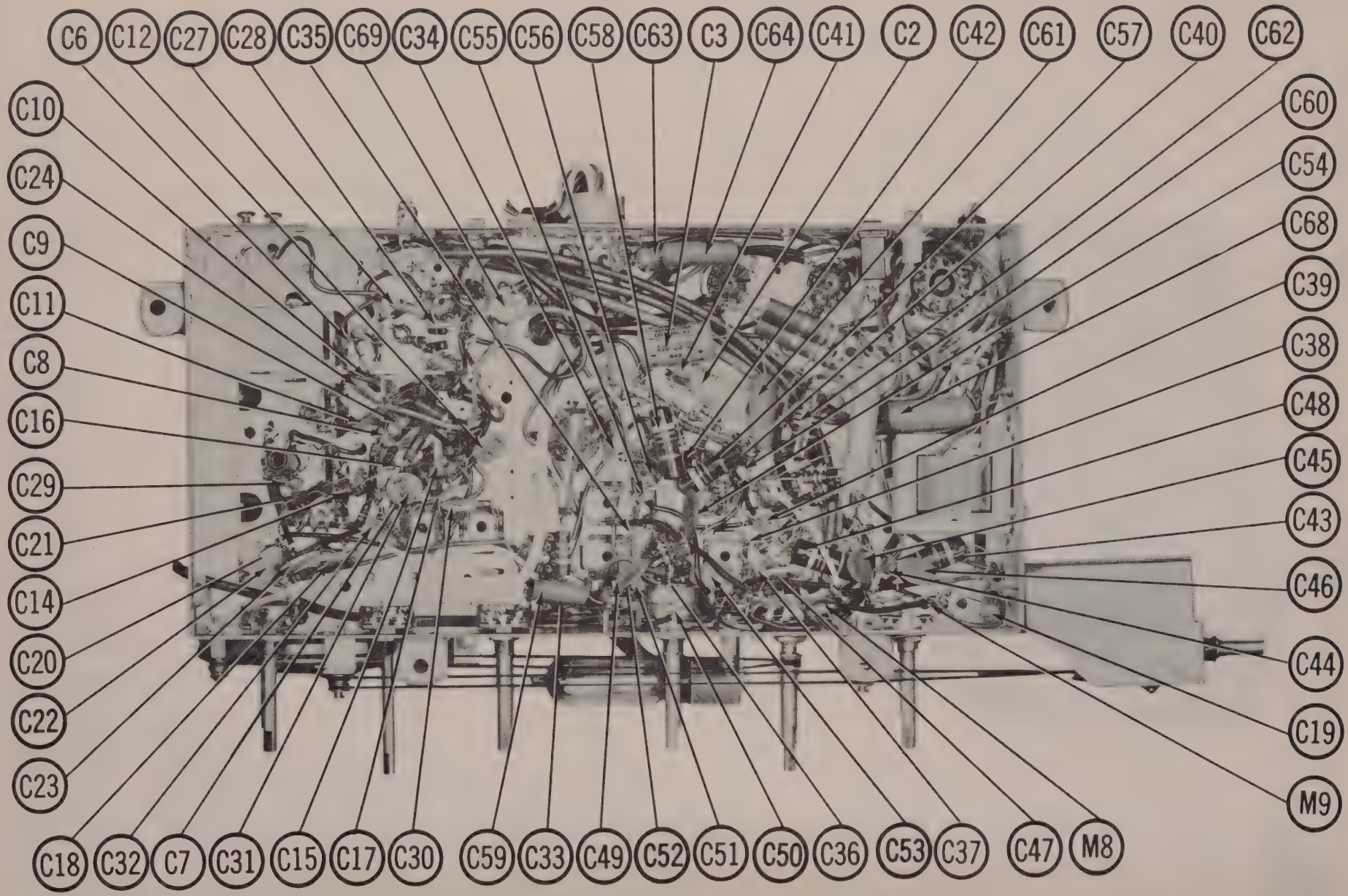
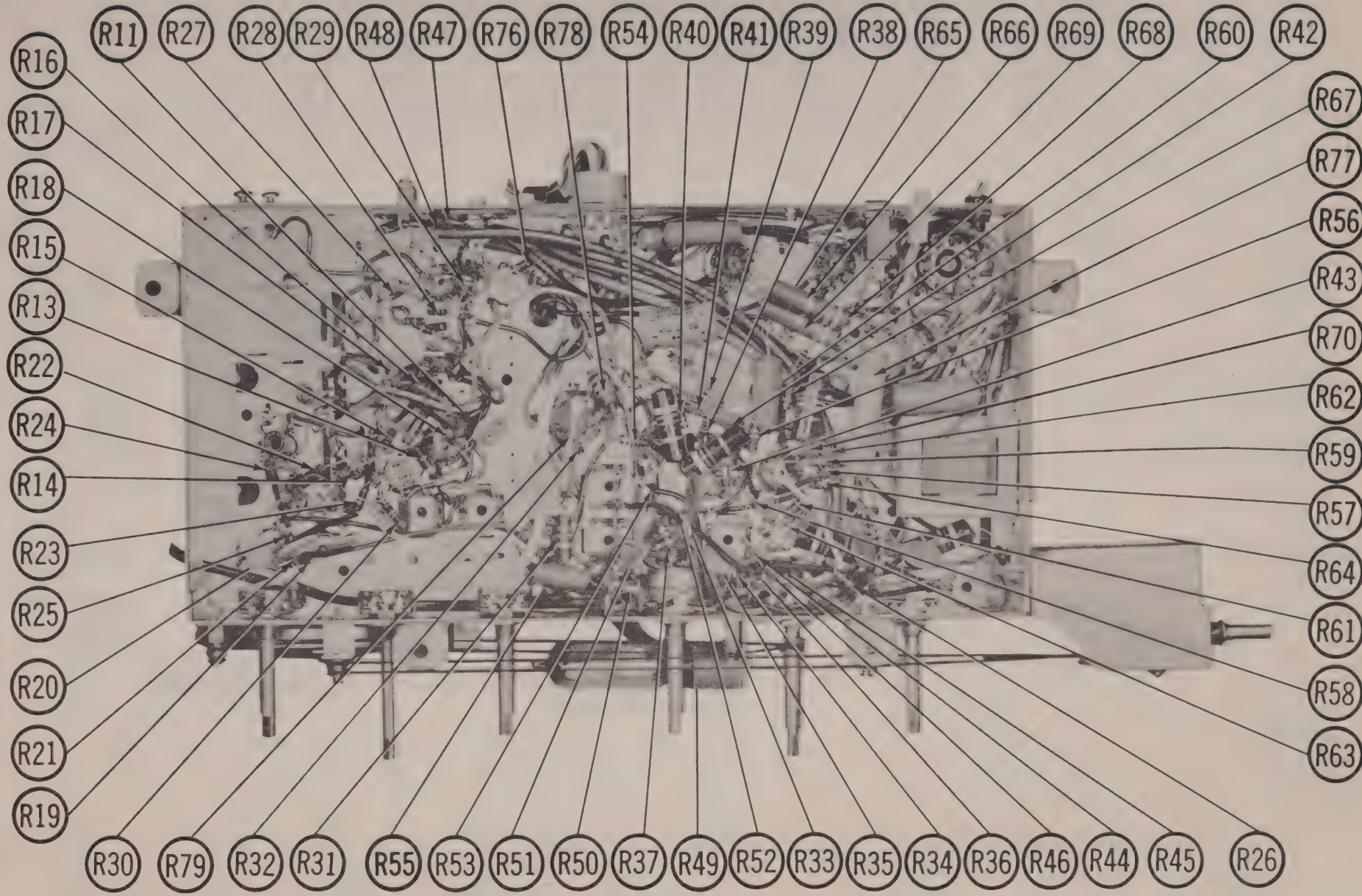
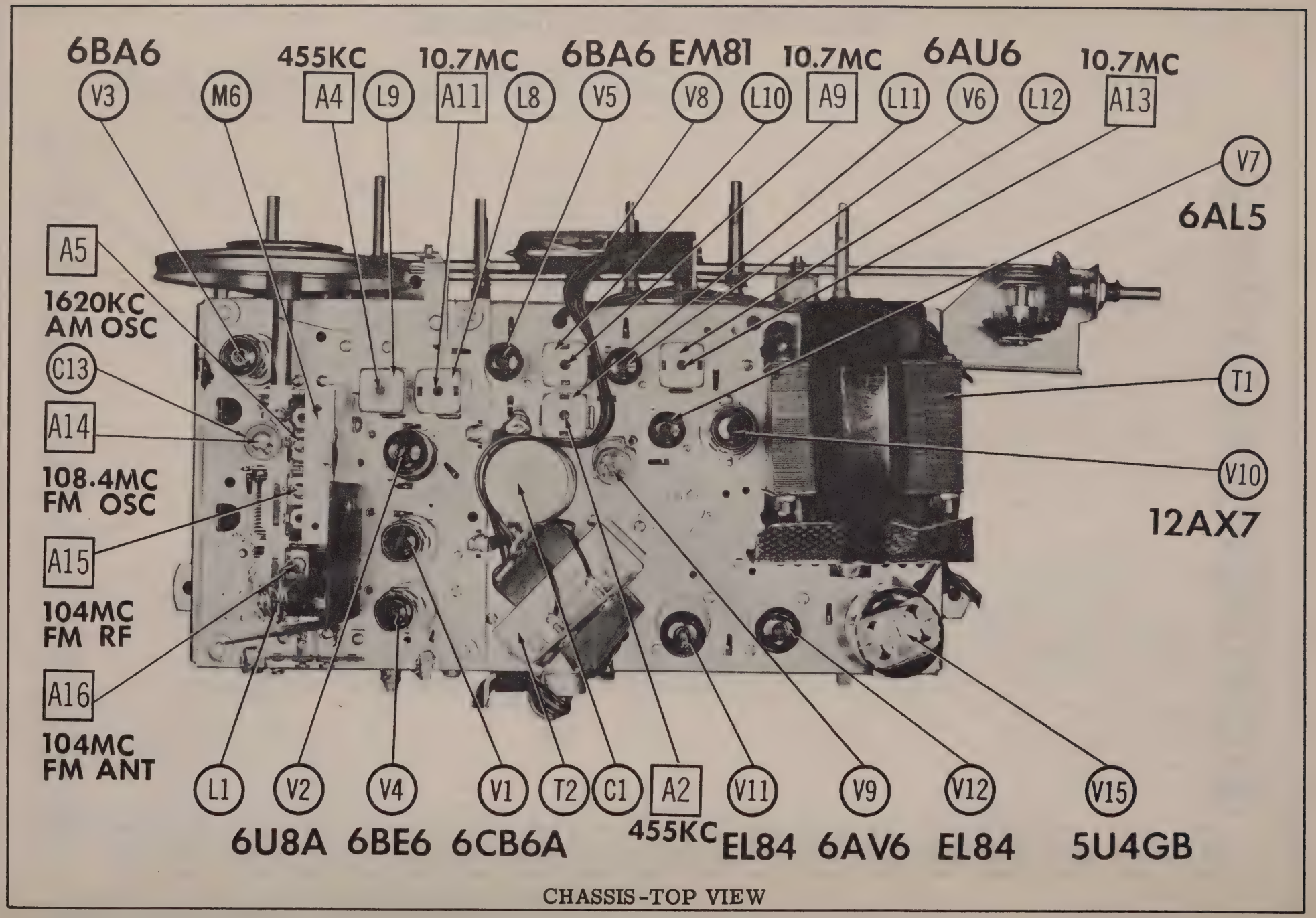
J58



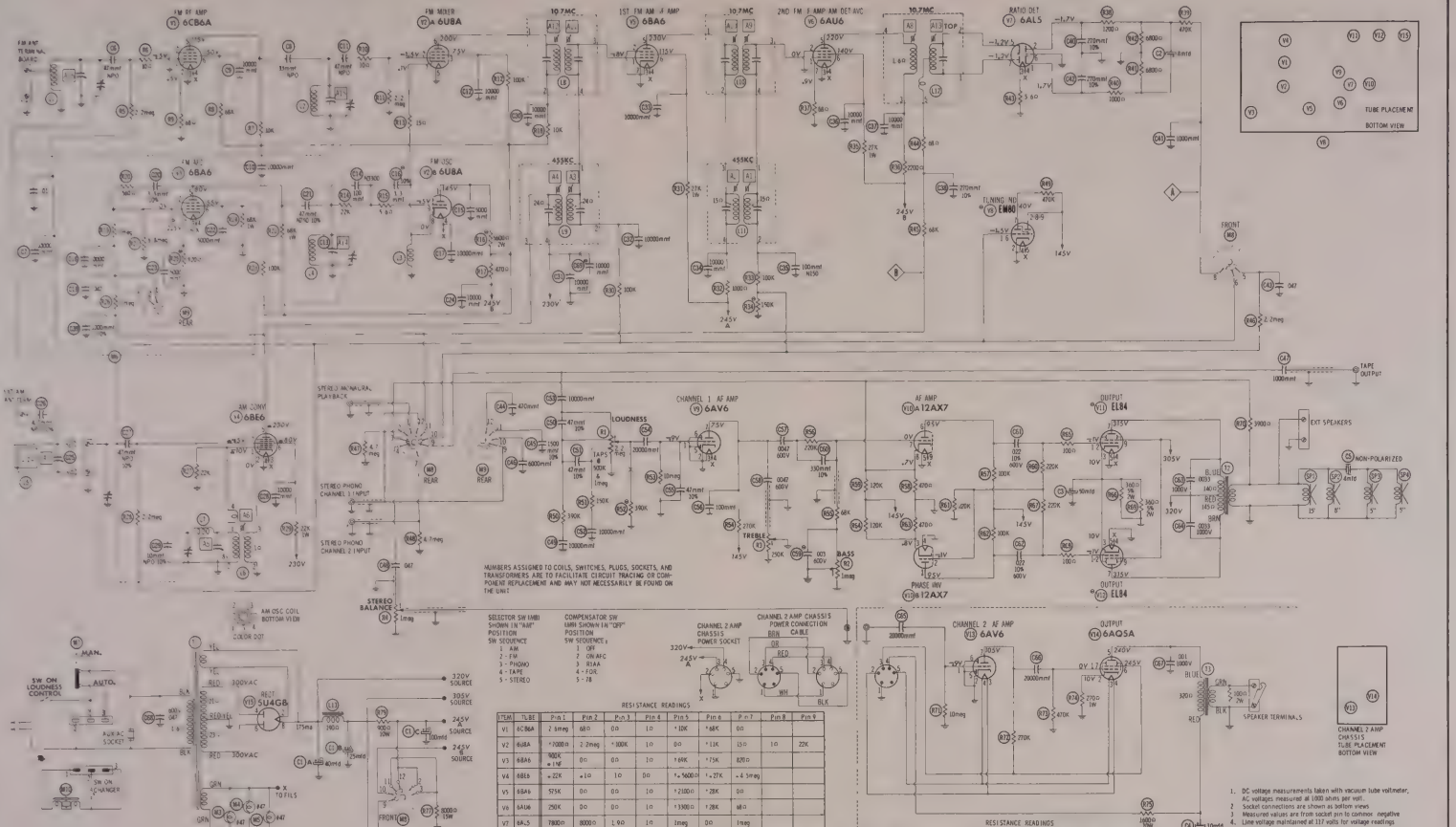

CHASSIS BOTTOM VIEW-CAPACITOR & MISC. IDENT.




CHASSIS BOTTOM VIEW-RESISTOR IDENT.




CHASSIS-TOP VIEW


FM RF AMP V1 6CB6A
FM MIXER V2A 6U8A
10.7MC
1ST FM AM IF AMP V3 6BA6
10.7MC
2ND FM & AMP AM DET AVC V4 6AU6
10.7MC
RATIO DET V1 6AL5
FM OSC V4 6BA6
FM OSC V2B 6U8A
455KC
455KC
TUNING IND V9 EM80
FRONT
TUBE PLACEMENT BOTTOM VIEW
AM CONV V4 6BE6
STEREO MONAURAL PLAYBACK
LOUDNESS
CHANNEL 1 AF AMP V6 6AV6
AF AMP V10A 12AX7
OUTPUT V11 EL84
TAPE OUTPUT
EXT SPEAKERS
NON-POLARIZED
STEREO PHONO CHANNEL 1 INPUT
STEREO PHONO CHANNEL 2 INPUT
REAR
TAPS
TREBLE
BASS
PHASE INV V10B 12AX7
OUTPUT V12 EL84
AM OSC COIL BOTTOM VIEW
COLOR DOT
STEREO BALANCE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
SELECTOR SW (MB) SHOWN IN "AM" POSITION
SW SEQUENCE
1 - AM
2 - FM
3 - PHONO
4 - TAPE
5 - STEREO
COMPENSATOR SW (MR) SHOWN IN "OFF" POSITION
SW SEQUENCE
1 - OFF
2 - ON AFC
3 - RIAA
4 - FOR
5 - 78
CHANNEL 2 AMP CHASSIS POWER SOCKET
CHANNEL 2 AMP CHASSIS POWER CONNECTION BIN CABLE
OR
CHANNEL 2 AF AMP V13 6AV6
OUTPUT V14 6AQ5A
SPEAKER TERMINALS
CHANNEL 2 AMP CHASSIS TUBE PLACEMENT BOTTOM VIEW
SW ON LOUDNESS CONTROL
MAN.
AUTO.
V15 5U4GB
AURAL SOCKET
SW ON CHANGER
TO FILS
320V SOURCE
305V SOURCE
245V SOURCE
245V SOURCE
230V SOURCE
145V SOURCE
FRONT
REAR
RESISTANCE READINGS
RESISTANCE READINGS
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
• MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 8 OF V15.
◉ MEASURED IN "FM-AFC" POSITION
NC NO CONNECTION
TP TIE POINT
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SILVERTONE MODELS 9061, 9062 (Ch. 528.53380)

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6CB6A | 7 1meg | 68Ω | 0Ω | 1Ω | †10K | †68K | 0Ω | | |
| V2 | 6U8A | †2000Ω | 2.2meg | †100K | 1Ω | 0Ω | †11K | 15Ω | 1Ω | 22K |
| V3 | 6BA6 | 100K • 1MF | 0Ω | 0Ω | 1Ω | †69K | †75K | 820Ω | | |
| V4 | 6BE6 | 4.22K | 10 | 1Ω | 0Ω | †•5600Ω | †4.27K | 4.5meg | | |
| V5 | 6BA6 | 575K | 0Ω | 0Ω | 1Ω | †2100Ω | †28K | 0Ω | | |
| V6 | 6AU6 | 250K | 0Ω | 0Ω | 1Ω | †3300Ω | †28K | 68Ω | | |
| V7 | 6AL5 | 7800Ω | 8000Ω | 1.9Ω | 1Ω | 1meg | 0Ω | 1meg | | |
| V8 | EM81 6BA5 | 475K | 0Ω | †33K | 0Ω | 1Ω | 475K | †50K | †33K | †33K |
| V9 | 6AV6 | 10meg | 0Ω | 0Ω | 1Ω | 0Ω | 0Ω | †30K | | |
| V10 | 12AX7 | †130K | 220K | 470Ω | 0Ω | 0Ω | †130K | 68K | 470Ω | .1Ω |
| V11 | EL84 6BQ5 | 440K | 440K | 180Ω | .1Ω | 0Ω | NC | †145Ω | NC | †190Ω |
| V12 | EL84 6BQ5 | 440K | 440K | 180Ω | 1Ω | 0Ω | NC | †145Ω | NC | †190Ω |
| V13 | 6AV6 | 10meg | 0Ω | .1Ω | 0Ω | 0Ω | 0Ω | †270K | | |

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V14 | 6AQ5A | 470K | 270Ω | 0Ω | 1Ω | †390Ω | †110Ω | 470K | |
| V15 | 5U4GB | NC | ¶ | TP | 2Ω | NC | 2Ω | NC | ¶ |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1, A2, A8 thru A13..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A3, A4..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5, A7, A14, A15, A16..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .1mfd | High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis. | 455KC (400~ Mod.) | AM | Tuning gang fully open | Across output terminals | A1, A2, A3, A4 | Adjust for maximum output. |
| 2. | | Loop | 1620KC | " | " | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 535KC | " | 535KC | " | A6 | Adjust for maximum output. Repeat steps 2 and 3 until no further improvement is noted. |
| 4. | | " | 1400KC | " | Tune to 1400KC signal | " | A7 (Located on loop) | Adjust for maximum output. |

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5. | | High side to ungrounded tube shield on 6U8 (V2). Low side to chassis. | 10.7MC (Unmod.) | FM | Tuning gang fully open | DC probe to point Ⓐ. Common to chassis. | A8, A9, A10, A11, A12 | Adjust for maximum deflection. |
| 6. | | " | " | " | " | DC probe to point Ⓑ. Common to chassis. | A13 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5. | | High side to ungrounded tube shield on 6U8 (V2). Low side to chassis. | 10.7MC (450KC Swp) | FM | Tuning gang fully open | Vert. Amp. to point Ⓐ. Low side to chassis. | A8, A9, A10, A11, A12 | Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. |
| 6. | | " | " | " | " | Vert. Amp. to point Ⓑ. Low side to chassis. | A13 | Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines. |

FM RF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | 270Ω Carbon Resistor | High side thru 270Ω to FM antenna terminal. Low side to chassis. | 108.4MC (400~ Mod. 45KC Swp.) | FM | 108.4MC | Across output terminals | A14 | Adjust for maximum output. |
| 8. | " | " | 87.6MC | " | 87.6MC | " | L4 | Adjust for maximum output by compressing or expanding coil turns while rocking tuning gang. Repeat steps 7 & 8. |
| 9. | " | " | 104MC | " | 104MC | " | A15, A16 | Adjust for maximum output. |
| 10. | " | " | 98MC | " | 98MC | " | L1 | Adjust for maximum output by compressing or expanding coil turns. |
| 11. | " | " | 90MC | " | 90MC | " | L2 | " |

FIG. 1

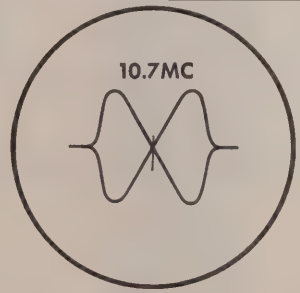
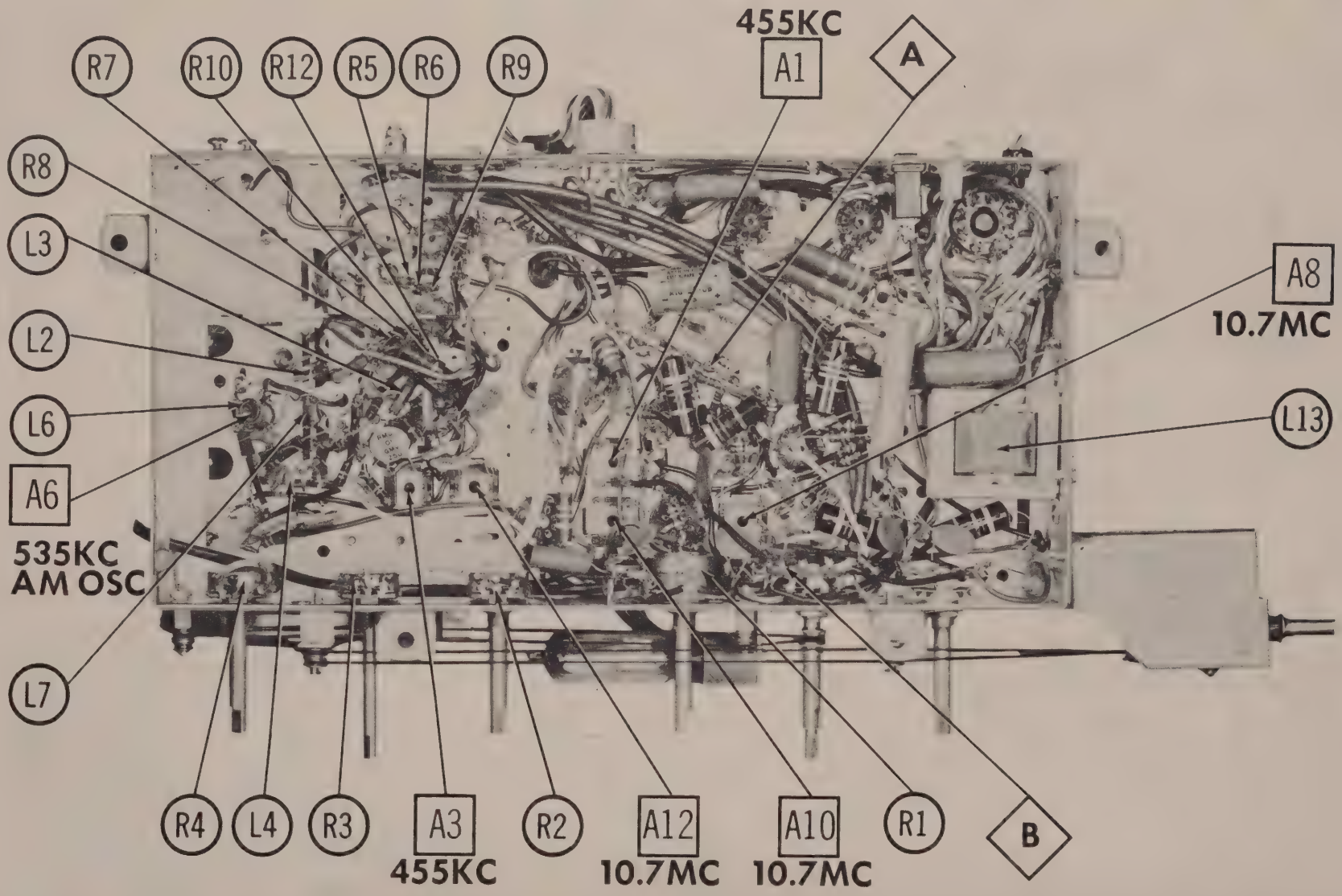



FIG. 2




CHASSIS BOTTOM VIEW-RESISTOR, INDUCTOR & ALIGN. IDENT.

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | FM RF Amplifier | 6CB6A | |
| V2 | FM Mixer - FM Osc. | 6U8A | |
| V3 | FM AFC | 6BA6 | |
| V4 | AM Converter | 6BE6 | |
| V5 | 1st FM-AM IF Amplifier | 6BA6 | |
| V6 | 2nd FM IF Amplifier- AM Det. - AVC | 6AU6 | |
| V7 | Ratio Detector | 6AL5 | |
| V8 | Tuning Indicator | EM81/6DA5 | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V9 | Channel 1 AF Amplifier | 6AV6 | |
| V10 | Channel 1 AF Amplifier- Channel 1 Phase Inverter | 12AX7 | |
| V11 | Channel 1 Output | EL84/6BQ5 | |
| V12 | Channel 1 Output | EL84/6BQ5 | |
| V13 | Channel 2 AF Amplifier | 6AV6 | |
| V14 | Channel 2 Output | 6AQ5A | |
| V15 | Rectifier | 5U4GB | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA SILVERTONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ■40 | 650 | 18-35-3 | AFH4-05-70 | D0044 | FP447 | | TVLS-4635.11* | |
| B | ▲25 | 350 | | | BR2035 | TC68 | | | |
| C | ▲100 | 350 | | | | | | | |
| D | 25 | 350 | | | | | | | |
| C2 | 8 | 50 | 18-74-5 | PRS150V8 | BBR8-150 | TC41 | TD-8-150 | TVA-1405 | |
| C3 | 50 | 25 | 18-23-0 | PRS25V50 | BBR50-25 | TC29 | TD-50-25 | TVA-1206 | |
| C4 | 10 | 350 | 18-38-0 | PRS350V10 | BR1045 | TC62 | TD-10-450 | TVA-1604 | |
| C5 | 4 | 150NP | 18-9-5 | NP-PRS450V4 | BBR8-150 † BBR8-150 † | TCN510 | TD-8-150 † TD-8-150 † | TVAS-1402.1* | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Connect negative leads together.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | REPLACEMENT DATA SILVERTONE PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C6 | 47 | | NPO | 15-470611 | NPO-SI 47 | TCZ-47 | CTA6Q47C | CNO-447 | 5TCC-Q47 | |
| C7 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C8 | 33 | | NPO | 15-330611 | NPO-SI 33 | TCZ-33 | CTA6Q33C | CNO-433 | 5TCC-Q33 | |
| C9 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C10 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C11 | 47 | | NPO | 15-470611 | NPO-SI 47 | TCZ-47 | CTA6Q47C | CNO-447 | 5TCC-Q47 | |
| C12 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C13 | | | | 19-3-5 | | | | | | |
| C14 | 100 | | N3300 | 15-101618 | | | | | | |
| C15 | 5000 | | | 15-50216 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C16 | 3.3 | | 10% | 20-45-0 | NPO-SI 3.3 | TCZ-3R3 | CTA6V33C | CNO-533 | 5TCCB-V33S 10%* | ① |
| C17 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C18 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C19 | .047 | 400 | | 16-47348 | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C20 | 3.3 | | 10% | 20-45-0 | NPO-SI 3.3 | TCZ-3R3 | CTA6V33C | CNO-533 | 5TCCB-V33S 10%* | |
| C21 | 47 | | N750 10% | 15-470611 | | TCN-47 | C10Q47U | CN7-447 | 5TCU-Q47S 10%* | |
| C22 | 5000 | | | 15-50216 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C23 | 5000 | | | 15-50216 | BPD-005 | DD-502 | BYA10D5 | B-250 | 5HK-D5 | |
| C24 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C25 | | | | 19-165-0 | | | | | | |
| C26 | 4.7 | | NPO 10% | 20-23-0 | NPO-SI 4.7 | TCZ-4R7 | CTA6V47C | CNO-547 | 5TCCB-V47S 10%* | |
| C27 | 47 | | NPO 10% | 15-470611 | NPO-SI 47 | TCZ-47 | CTA6Q47C | CNO-447 | 5TCC-Q47S 10%* | |
| C28 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C29 | 10 | | NPO 10% | 15-100611 | NPO-SI 10 | TCZ-10 | CTA6Q1C | CNO-410 | 5TCC-Q1S 10%* | |
| C30 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C31 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C32 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C33 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C34 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C35 | 100 | | N150 | 15-10116 | | | | | | |
| C36 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C37 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C38 | 270 | | 10% | 15-27111 | DI-270 | MD-271 | L10T27 | | 5GA-T27S 10% * | |
| C39 | 1000 | | 10% | 15-10261 | DI-1000 | | BYA10D1M | JL-210 | 5HK-D1S 10% * | |
| C40 | 270 | | 10% | 15-27111 | DI-270 | MD-271 | L10T27 | B-327 | 5GA-T27S 10% * | |
| C41 | 1000 | | | 15-10211 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |

## CAPACITORS (cont)

| ITEM No. | RATING CAP. | RATING VOLT | RATING TOL | REPLACEMENT DATA SILVERTONE PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C42 | 270 | | 10% | 15-27111 | DI-270 | MD-271 | L10T27 | | 5GA-T27S 10% * | |
| C43 | .047 | 400 | | 16-47348 | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C44 | 470 | | | 15-47111 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C45 | 1500 | | 10% | 15-15211 | DI-1500 | | | JL-215 | 5HK-D15S 10% * | |
| C46 | 6000 | | | 15-60211 | | DD16-602 | HVC20D6 | B-260 | 5GA-D6S * | |
| C47 | 1000 | | | 15-10211 | BPD-001 | DD-102 | BYA10D1M | B-210 | 5HK-D1 | |
| C48 | .047 | 400 | | 16-47348 | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C49 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C50 | 47 | | 10% | 15-47061 | NPO-SI 47 | TCZ-47 | CTA6Q47C | CNO-447 | 5TCC-Q47S 10%* | |
| C51 | 47 | | 10% | 15-47061 | NPO-SI 47 | TCZ-47 | CTA6Q47C | CNO-447 | 5TCC-Q47S 10%* | |
| C52 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C53 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C54 | 20000 | | | 15-20316 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C55 | 47 | | 10% | 15-47061 | NPO-SI 47 | TCZ-47 | CTA6Q47C | CNO-447 | 5TCC-Q47S 10%* | |
| C56 | 100 | | | 15-10116 | BPD-0001 | DD-101 | L10T1 | UC-310 | 5GA-T1 | |
| C57 | .0047 | 600 | | 16-47258 | P688N-0047 | D6-472 | CUB6D47 | GEM-6247 | 6TM-D47 | |
| C58 | .0047 | 600 | | 16-47258 | P688N-0047 | D6-472 | CUB6D47 | GEM-6247 | 6TM-D47 | |
| C59 | .003 | 600 | | 16-30258 | P688N-003 | D6-302 | CUB6D3 | GEM-623 | 6TM-D3 | ② |
| C60 | 330 | | 10% | 15-33111 | DI-330 | DD-331 | L10T33 | JL-333 | 5GA-T33S 10% * | |
| C61 | .022 | 600 | 10% | 16-22357 | | | | | 6TM-S22S 10% * | |
| C62 | .022 | 600 | 10% | 16-22357 | | | | | 6TM-S22S 10% * | |
| C63 | .0033 | 1000 | | 16-33268 | P1088N-0033 | | CUB10D33 | GEM-16233 | 10TM-D33S * | |
| C64 | .0033 | 1000 | | 16-33268 | P1088N-0033 | | CUB10D33 | GEM-16233 | 10TM-D33S * | |
| C65 | 20000 | | | 15-20316 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C66 | 20000 | | | 15-20316 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C67 | .001 | 1000 | | 16-10268 | P1088N-001 | | CUB10D1 | GEM-1021 | 10TM-D1 | |
| C68 | .047 | 600 | | 20-647-1 | P688N-047 | | CUB6S47 | GEM-6147 | 6TM-S47 | |
| C69 | 10000 | | | 15-10316 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | ③ |

① Some versions may use 6.8mmf NPO 10% in this application (Part #20-27-0).
② Some versions may use .0047mfd 600V in this application (Part #16-47258).
③ Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA SILVERTONE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2.2meg | ½ | 24-328-0 | BT-175 | | Q13-139XX | UDT-296 | Loudness, Taps ② 500K & 1meg |
| B | Switch | | | KR-1 | | 76-1 | US-26 | |
| R2A | 1meg | ½ | 24-180-2 | B-69 | A47-1meg-Z | Q11-137 | U54 | Bass |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R3A | 250K | ½ | 24-181-2 | AB-51 | A47-250K-Z | Q13-130 | U44 | Treble |
| B | Shaft | | | AK-8 | RS-3/16 | NQ | DS-37 | |
| R4A | 1meg | ½ | 24-327-0 | B-743 | A47-1meg-Z | Q13-137 | U53 | Stereo Balance |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING OHMS | RATING WATT | SILVERTONE PART No. | NOTES |
|---|---|---|---|---|
| R5 | 2.2meg | | 60-22501 | |
| R6 | 10Ω | | 60-10001 | |
| R7 | 10K | | 60-10301 | |
| R8 | 68K | | 60-68301 | |
| R9 | 68Ω | | 60-68001 | |
| R10 | 10Ω | | 60-10001 | |
| R11 | 2.2meg | | 60-22501 | |
| R12 | 100K | | 60-10401 | |
| R13 | 15Ω | | 60-15001 | |
| R14 | 22K | | 60-22301 | |
| R15 | 5.6Ω | | 60-56901 | |
| R16 | 5600Ω | 2 | 60-56211 | ① |
| R17 | 470Ω | | 60-47101 | |
| R18 | 10K | | 60-10301 | |
| R19 | 1meg | | 60-10501 | |
| R20 | 560Ω | | 60-56101 | |

| ITEM No. | RATING OHMS | RATING WATT | SILVERTONE PART No. | NOTES |
|---|---|---|---|---|
| R21 | 6.8meg | | 60-68502 | |
| R22 | 68K | 1 | 60-68311 | |
| R23 | 100K | | 60-10401 | |
| R24 | 68K | 1 | 60-68311 | |
| R25 | 820Ω | | 60-82101 | ② |
| R26 | 1meg | | 60-10502 | |
| R27 | 22K | | 60-22301 | |
| R28 | 2.2meg | | 60-22501 | |
| R29 | 22K | 1 | 60-22311 | |
| R30 | 100K | | 60-10401 | |
| R31 | 27K | 1 | 60-27311 | |
| R32 | 1000Ω | | 60-10201 | |
| R33 | 100K | | 60-10401 | |
| R34 | 150K | | 60-15401 | ③ |
| R35 | 27K | 1 | 60-27311 | |
| R36 | 2200Ω | | 60-22202 | |

# PARTS LIST AND DESCRIPTIONS (cont)

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | SILVERTONE PART No. | NOTES |
|---|---|---|---|---|
| R37 | 68Ω | | 60-68001 | |
| R38 | 1200Ω | | 60-12201 | |
| R39 | 470K | | 60-47401 | |
| R40 | 1000Ω | | 60-10201 | |
| R41 | 6800Ω | | 60-68201 | |
| R42 | 6800Ω | | 60-68201 | |
| R43 | 5.6Ω | | 60-56901 | |
| R44 | 68Ω | | 60-68001 | |
| R45 | 68K | | 60-68301 | |
| R46 | 2.2meg | | 60-22502 | |
| R47 | 4.7meg | | 60-47502 | |
| R48 | 4.7meg | | 60-47502 | |
| R49 | 470K | | 60-47401 | |
| R50 | 390K | | 60-39401 | |
| R51 | 150K | | 60-15401 | |
| R52 | 390K | | 60-39401 | ④ |
| R53 | 10meg | | 60-10602 | |
| R54 | 270K | | 60-27401 | |
| R55 | 68K | | 60-68301 | |
| R56 | 220K | | 60-22401 | |
| R57 | 100K | | 60-10401 | |
| R58 | 470Ω | | 60-47101 | |
| R59 | 120K | | 60-12401 | |
| R60 | 220K | | 60-22401 | |
| R61 | 220K | | 60-22401 | |
| R62 | 100K | | 60-10401 | |
| R63 | 470Ω | | 60-47101 | |
| R64 | 120K | | 60-12401 | |
| R65 | 100Ω | | 60-10102 | |
| R66 | 360Ω 5% | 2 | 60-36125 | |
| R67 | 220K | | 60-22401 | |
| R68 | 100Ω | | 60-10102 | |
| R69 | 360Ω 5% | 2 | 60-36125 | |
| R70 | 3900Ω | | 60-39201 | |
| R71 | 10meg | | 60-10602 | |
| R72 | 270K | | 60-27401 | |
| R73 | 470K | | 60-47401 | |
| R74 | 270Ω | 1 | 60-27111 | |
| R75 | 1600Ω | 10 | | |
| R76 | 4700Ω | | 60-47201 | |
| R77 | 8000Ω | 15 | 61-136-0 | |
| R78 | 33K | 2 | 60-33321 | |
| R79 | 900Ω | 10 | 61-137-0 | |

① Some versions may use 15K in this application (Part #60-15311).
② Some versions may use 470Ω in this application (Part #60-47101).
③ Some versions may use 390K in this application (Part #60-39401).
④ Not used in some versions.

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA SILVERTONE PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| L1 | FM Ant. Coil | 10-3-1 | | | | | |
| L2 | FM RF Coil | 10-24-1 | | | | | |
| L3 | Cathode Choke | 10-140-1 | | | | | 2.2 Microhenries |
| L4 | FM Osc. Coil | 10-47-4 | | | | | |
| L5 | Loop Antenna | 82-9-1 | | | | | |
| L6 | AM Osc. Coil | 10-46-4 | | | | | |
| L7 | RF Choke | 10-129-1 | | | 4588 | | .55 Microhenries |
| L8 | 1st FM IF Trans. | 10-44-2 | 16-3487 | FM-254 | 1463 | | |
| L9 | 1st AM IF Trans. | 10-101-2 | 16-6758 | BC-352 | 12-C1 | RF-1 | |
| L10 | 2nd FM IF Trans. | 10-44-2 | 16-3487 | FM-254 | 1463 | | |
| L11 | 2nd AM IF Trans. | 10-45-2 | 16-6758 | BC-353 | 12-C2 | RF-2 | |
| L12 | Ratio Detector | 10-15-0 | 17-3498 | FM-255 | 1465 | | |

## FILTER CHOKE

| ITEM No. | RATINGS CURRENT (Measured) | DC RES. | INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| L13 | .070A | 190Ω | 4 Hy. | 80-11-6 | 26C82 ① | C-2994 ① | F-804 ① | C-2327 ① | 26C82 ① | C-24X ① |

① Use original channel frame and rotate 90°.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | SEC. 1 | SEC. 2 | REPLACEMENT DATA SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V | 600VCT @ .175A | 5V @ 3A | 80-11-0 | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V @ 5.7A | | | | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | SEC. | REPLACEMENT DATA SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 6700Ω CT | 6-8Ω | 80-24-1 | 24S55 | A-2905① | AU-609 | A-2313 | 24S55 | S-57Z | ① Drill new mounting hole. |
| T3 | 5000Ω | 6-8Ω | 80-74-1 | 26S46 | A-2904 | AU-604 | A-3337 | 26S46 | S-53X | |

## SPEAKER

| ITEM No. | TYPE SIZE | FIELD | V. C. IMP. | REPLACEMENT DATA SILVERTONE PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 15" | PM | 6-8Ω | 33-319-4 ① | 15A10Z6.9 ① | ① Parallel and Phase |
| SP2 | 8" | PM | 14Ω | 33-365-4 ① | 8A31Z14.2 ① | |
| SP3 | 5" | PM | 10Ω | 33-375-4 ① | 5A15TZ10 ① | |
| SP4 | 5" | PM | 10Ω | 33-375-4 ① | 5A15TZ10 ① | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA SILVERTONE PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | REMARKS |
|---|---|---|---|---|---|---|
| M1 | 33-299-0 | 13-TB * | | | | * Includes needles and mounting mechanism. |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA SILVERTONE PART No. | JENSEN PART No. | WALCO PART No. | REMARKS |
|---|---|---|---|---|
| M2 | 57-57165D (LP) 57-5715 (78RPM) | | * W101STS † * W102S † * W101STD ♦ | * Includes cartridge, requires mounting mechanism † Jewel ♦ Diamond |

## MISCELLANEOUS

| ITEM No. | PART NAME | SILVERTONE PART No. | NOTES |
|---|---|---|---|
| M3 | Lamp | 89-7 | #47 |
| M4 | Lamp | 89-7 | #47 |
| M5 | Lamp | 89-7 | #47 |
| M6 | Tuning Cap. | 19-6-6 | 5 Gang (AM Sections: Ant. 14-482mmf, Osc. 16-170mmf) |
| M7 | Switch | 69-269-0 | Automatic Power, DPST (Slide Type) |
| M8 | Switch | 69-277-0 | Selector, 5 Position (Rotary Wafer Type) |
| M9 | Switch | 69-278-0 | Compensator, 5 Position (Rotary Wafer Type) |
| M10 | Motor | 59-97 | Complete, Changer Ch. 528.56380 |
| | Motor | 59-98 | Complete, Changer Ch. 528.56390 |

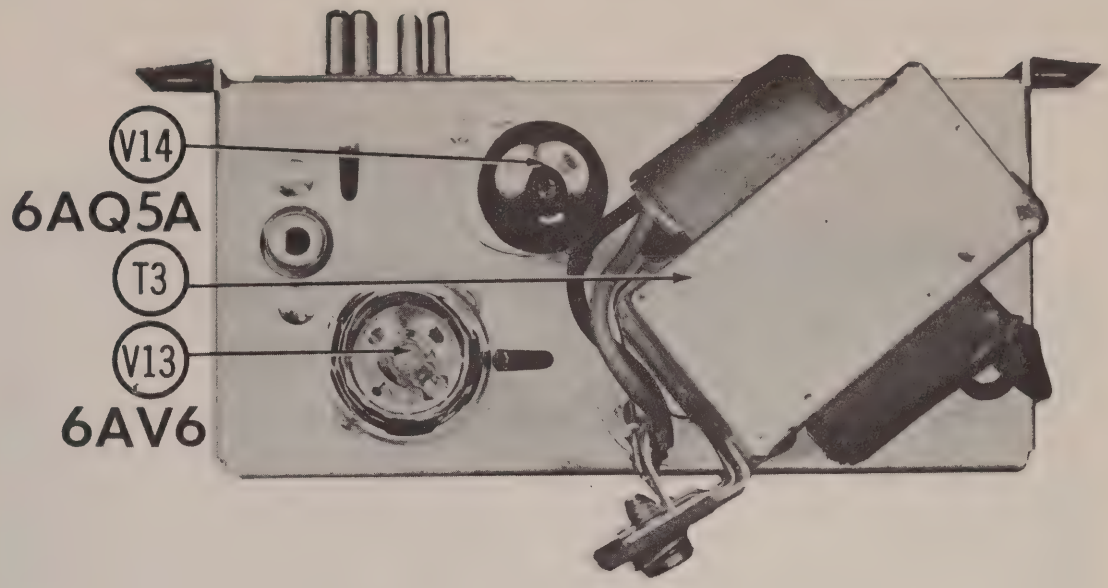
## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

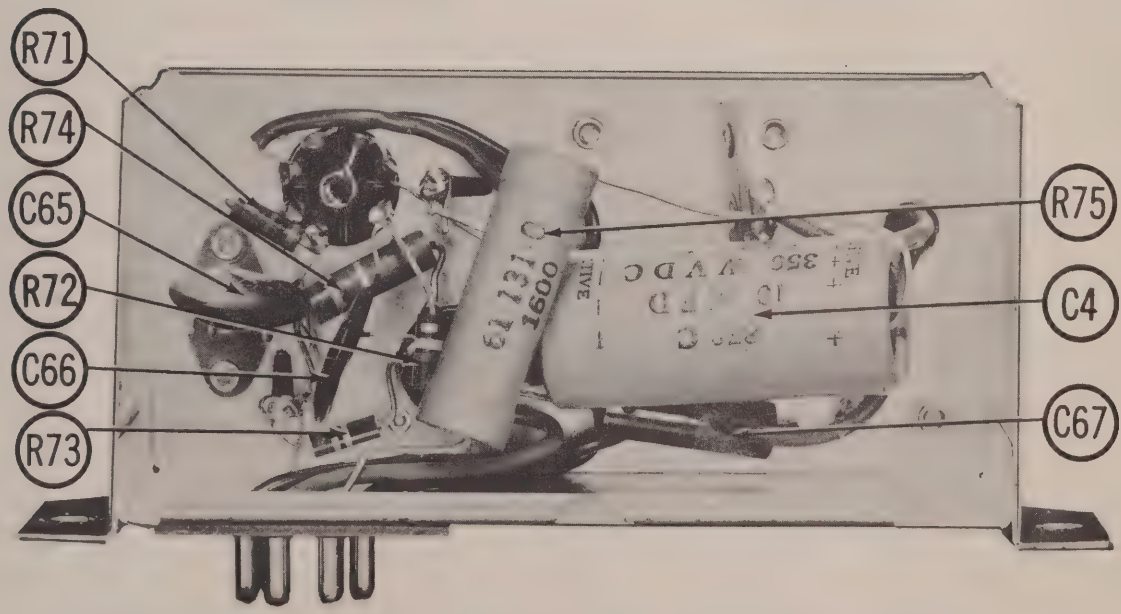
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 52-1109-0 | Tuning |
| Knob | 52-1132-0 | Volume-On-Off |
| Knob | 52-1115-0 | Indicator |
| Knob | 52-1131-0 | Dual, Dummy |
| Knob | 49-354 | Phono Door |
| Knob | 52-1122-0 | On-Off-Reject |
| Knob | 52-917-0 | Speed Control |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)




CHANNEL 2 CHASSIS-TOP VIEW




CHANNEL 2 CHASSIS-BOTTOM VIEW

PHOTOFACT* Folder

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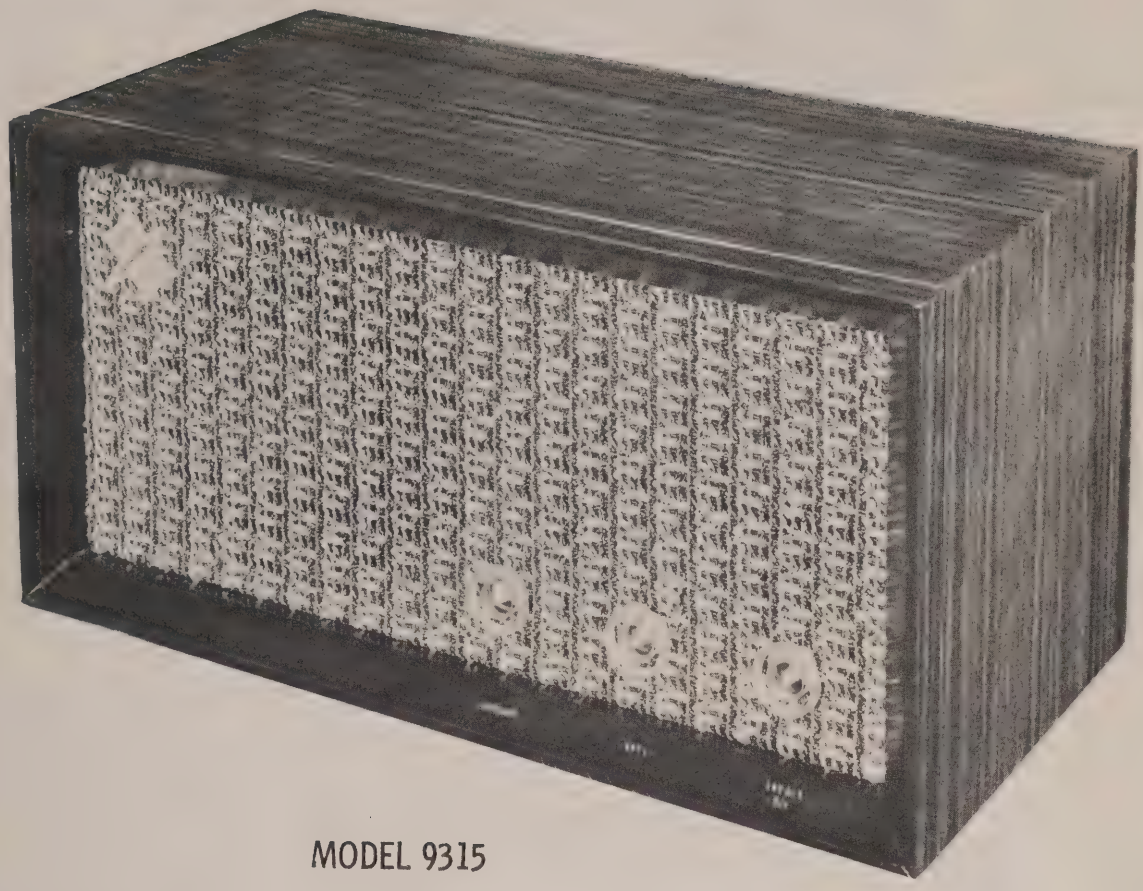
# SILVERTONE MODELS 9315, 9316, 9317, 9318 (Ch. 450.10000)

SILVERTONE MODELS 9315, 9316, 9317, 9318 (Ch. 450.10000)



MODEL 9315

SILVERTONE MODELS 9315, 9316, 9317, 9318 (Ch. 450.10000)

| | |
|---|---|
| TRADE NAME | Silvertone Models 9315, 9316, 9317, 9318 (Ch. 450.10000) |
| SUPPLIER | Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois |
| TYPE SET | AC Operated 5 Tube Audio Amplifier |
| POWER SUPPLY | 110 - 120 Volts AC, 60 Cycles RATING 61 Watts, .58 Amp. @117 Volts AC |

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J152



SET 445 FOLDER 14

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | AF Amplifier | 6AU6 | |
| V2 | AF Amp. -Phase Inv. | 12AX7 | |
| V3 | Output | 6V6GT | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V4 | Output | 6V6GT | |
| V5 | Rectifier | 5Y3GT | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Silvertone PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | ▲40 | 350 | A-110197 | AFH4-52 | D0430 | FP419.3 | TMQ-57 | TVL-4621.6 | |
| B | ■30 | 300 | | | | | | | |
| C | ▲20 | 250 | | | | | | | |
| D | 20 | 25 | | | | | | | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | Silvertone PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C2 | 510 | | 5% | | 1464-00051 | | 5R5T57 | | MS-351 | ① |
| C3 | 50000 | | | A-110196-5 | BPD-05 | DF-503 | | BT-150 | | |
| C4 | 20000 | | | A-110196-2 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C5 | 20000 | | | A-110196-3 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C6 | 2200 | | | A-110196-1 | BPD-0022 | DD-222 | BYA10D22 | B-222 | 5HK-D22 | |
| C7 | 20000 | | | A-110196-3 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C8 | 220 | | | A-110196 | BPD-00022 | DD-221 | L10T22 | B-221 | 5GA-T22 | |
| C9 | 2200 | | | A-110196-1 | BPD-0022 | DD-222 | BYA10D22 | B-222 | 5HK-D22 | |
| C10 | 20000 | | | A-110196-3 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C11 | 20000 | | | A-110196-4 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |
| C12 | 20000 | | | A-110196-4 | BPD-02 | DD-203 | BYB6S2 | B-120 | 5GA-S2 | |

① Not used in some versions

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Silvertone PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 1meg | ½ | A-110190 | B-70 | A47-1meg-Z | Q13-137 | U53 | Loudness |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R2A | 1meg | ½ | A-110191 | B-69 | A47-1meg-S | Q11-137 | U54 | Bass |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R3A | 1meg | ½ | A-110192 | B-69 | A47-1meg-S | Q11-137 | U54 | Treble |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | |

## RESISTORS

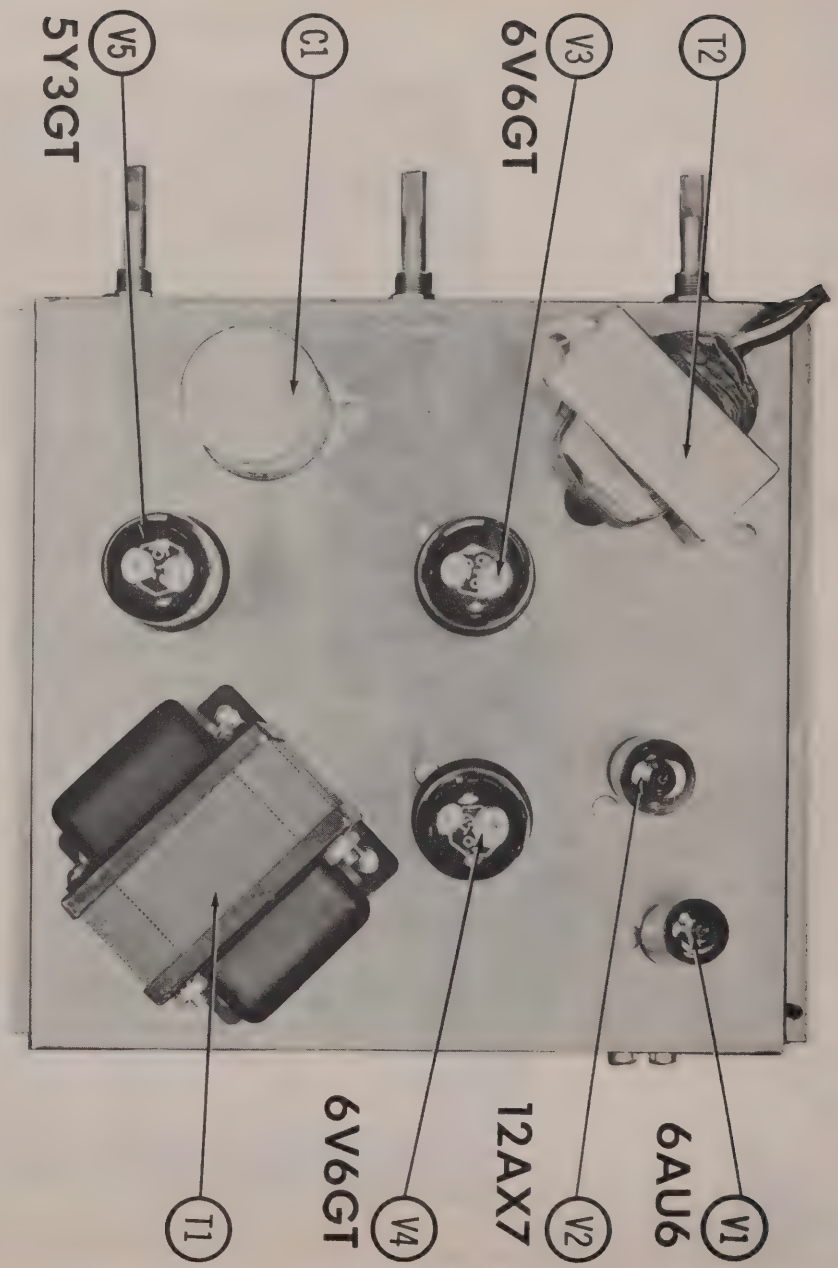
All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | Silvertone PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R4 | 6.8meg | | BR16C685 | |
| R5 | 1.2meg5% | | BR16C125 | Note 1 |
| R6 | 100K | | BR16C104 | |
| R7 | 270K | | BR16C274 | |
| R8 | 470Ω | | BR16C471 | |
| R9 | 47K | | BR16C473 | |
| R10 | 10K | | BR16C103 | |
| R11 | 100K | | BR16C104 | |
| R12 | 470K | | BR16C474 | |
| R13 | 4700Ω | | BR16C472 | |
| R14 | 47K | | BR16C473 | |

| ITEM No. | RATING | | Silvertone PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R15 | 470K | | BR16C474 | |
| R16 | 100K 5% | | BR15C104 | |
| R17 | 6800Ω | | BR16C682 | |
| R18 | 100K 5% | | BR15C104 | |
| R19 | 470K | | BR16C474 | |
| R20 | 470K | | BR16C474 | |
| R21 | 180Ω | 2 | BR16G181 | |
| R22 | 3900Ω | 1 | BR16E392 | |
| R23 | 470Ω | 1 | BR16E471 | |
| R24 | 68Ω | | BR16C680 | |
| R25 | 68Ω | | BR16C680 | |

Note 1. Some versions may use 1meg in this application (Part #BR16C105)

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Con't)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | Silvertone PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V @ .58A | 540 VCT @ .090A | 5V @ 2A | A-181267-1 | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V @ 1.5A | | | | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | Silvertone PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 4300Ω CT | 6-8Ω | A-181268-1 | 22S88 | A-2905① | AU-609 | A-3870 | 22S88 | S-55X | ① Drill new mounting hole |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | Silvertone PART No. | QUAM PART No. | |
| SP1 | 8" | PM | 6-8Ω | A-132059 | 8A31Z7 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | Silvertone PART No. | NOTES |
|---|---|---|---|
| M1 | Lamp | A-110195-1 | #47 |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

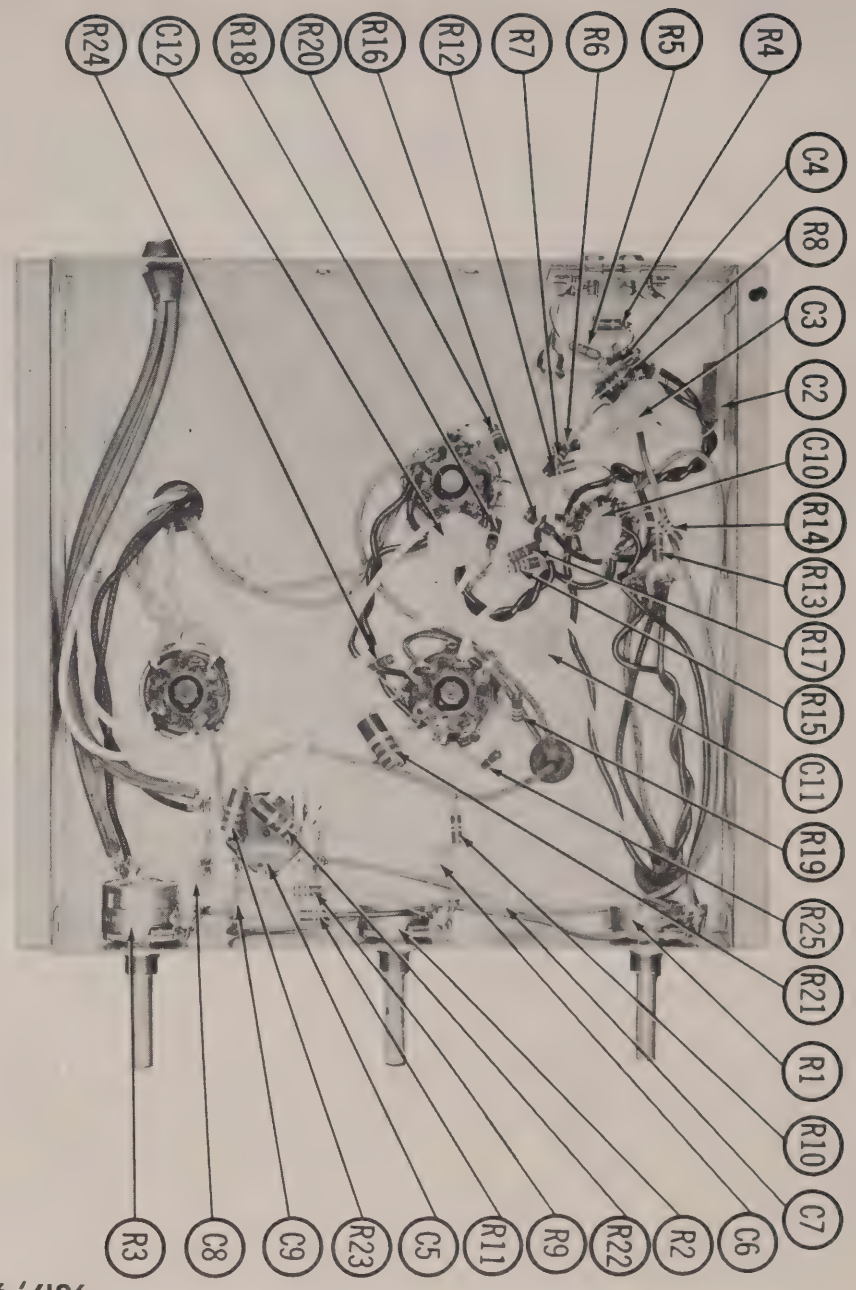
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | A-110180 | 3 Used, Model 9315 |
| Knob | A-110186 | 3 Used, Model 9316 |
| Cabinet | C-124553-1 | Mahogany, Model 9315 |
| Cabinet | C-124553-2 | Limed Oak, Model 9316 |

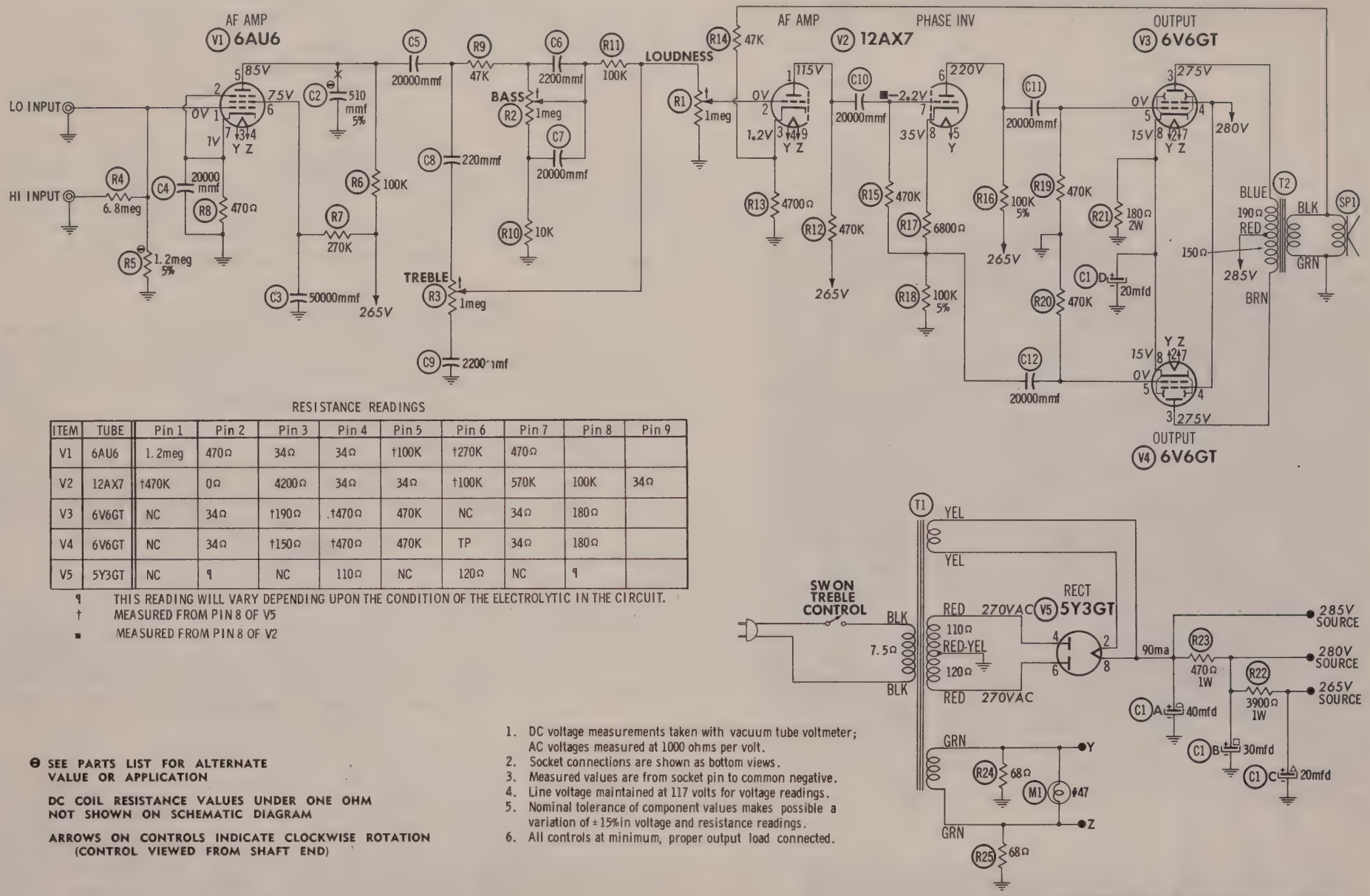
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

# CHASSIS—BOTTOM VIEW






RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6AU6 | 1.2meg | 470Ω | 34Ω | 34Ω | †100K | †270K | 470Ω | | |
| V2 | 12AX7 | †470K | 0Ω | 4200Ω | 34Ω | 34Ω | †100K | 570K | 100K | 34Ω |
| V3 | 6V6GT | NC | 34Ω | †190Ω | †470Ω | 470K | NC | 34Ω | 180Ω | |
| V4 | 6V6GT | NC | 34Ω | †150Ω | †470Ω | 470K | TP | 34Ω | 180Ω | |
| V5 | 5Y3GT | NC | ¶ | NC | 110Ω | NC | 120Ω | NC | ¶ | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5
■ MEASURED FROM PIN 8 OF V2

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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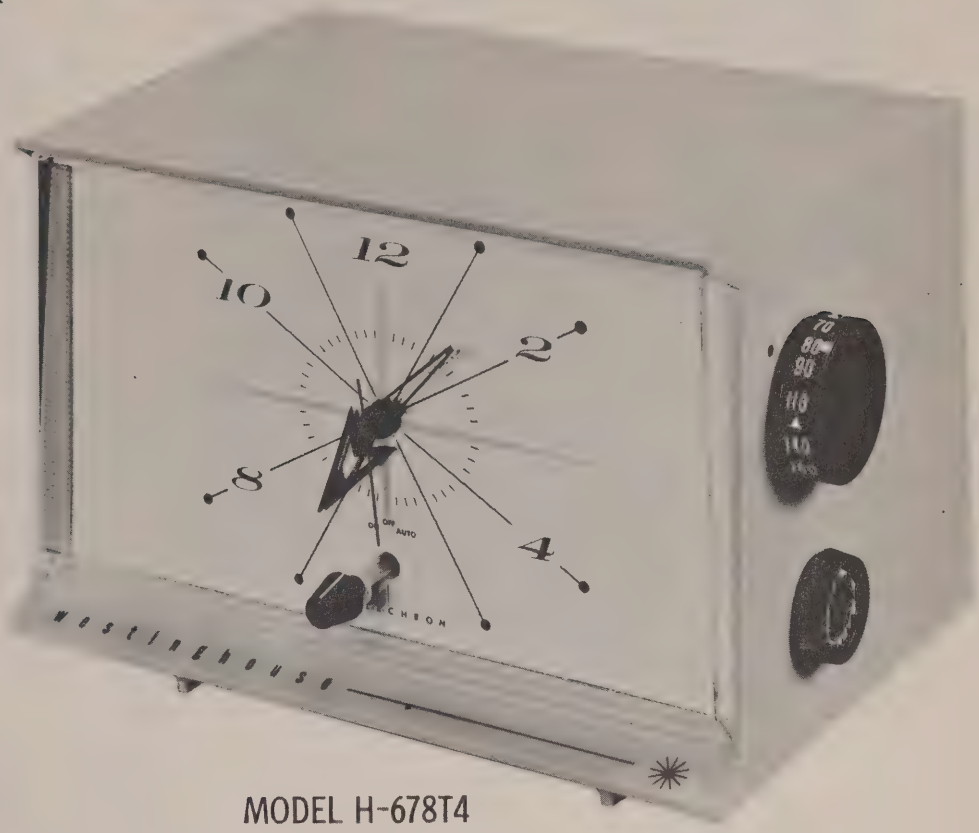
**SILVERTONE MODELS 9315, 9316, 9317, 9318 (Ch. 450.10000)**

PHOTOFACT* Folder with CIRCUITRACE*
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# WESTINGHOUSE MODELS H-677T4, H-678T4, H-679T4 (Ch.V-2239-6)

WESTINGHOUSE MODELS H-677T4, H-678T4, H-679T4 (Ch.V-2239-6)




MODEL H-678T4

WESTINGHOUSE MODELS H-677T4, H-678T4, H-679T4 (Ch.V-2239-6)

| | |
|---|---|
| TRADE NAME | Westinghouse Models H-677T4, H-678T4, H-679T4 (CH. V-2239-6) |
| MANUFACTURER | Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J. |
| TYPE SET | AC Operated 4 Tube AM Receiver With Electric Clock |
| POWER SUPPLY | 105 - 120 Volts AC, 60 Cycles |
| RATING | 26 Watts, .28 Amp. @117 Volts AC (Less Clock) |
| TUNING RANGE—BROADCAST | 540 - 1600KC |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A3, A4.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

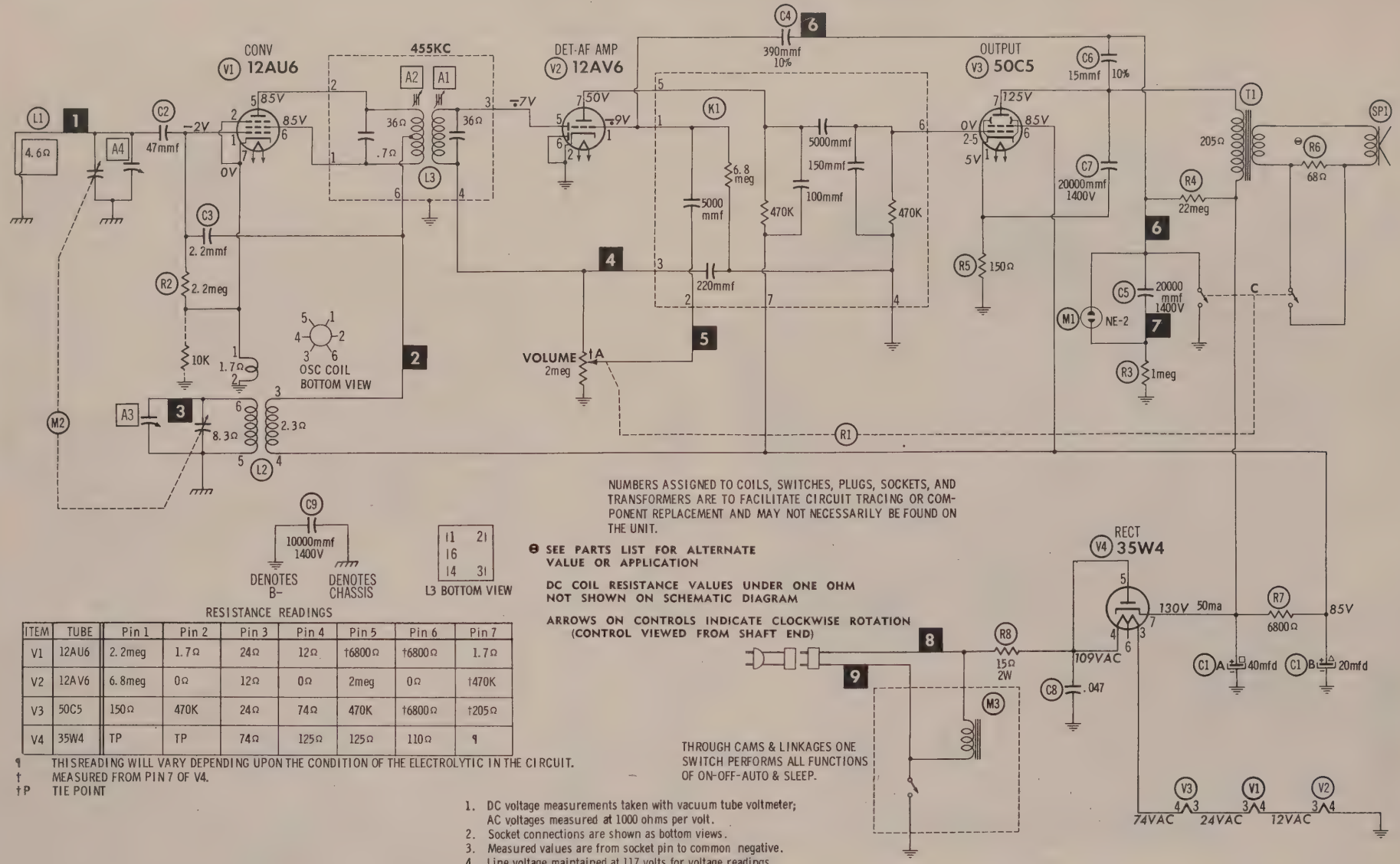
| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | 200mmf. | High side to antenna stator lug of tuning gang. Low side to B-. | 455KC (400~ Mod.) | Tuning gang fully open | Across voice coil | A1, A2 | Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation. |
| 2. | | Loop | 1625KC | " | " | A3 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 1400KC | 1400KC | " | A4 | " |

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



SET 445 FOLDER 15




NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

THROUGH CAMS & LINKAGES ONE SWITCH PERFORMS ALL FUNCTIONS OF ON-OFF-AUTO & SLEEP.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12AU6 | 2.2meg | 1.7Ω | 24Ω | 12Ω | †6800Ω | †6800Ω | 1.7Ω |
| V2 | 12AV6 | 6.8meg | 0Ω | 12Ω | 0Ω | 2meg | 0Ω | †470K |
| V3 | 50C5 | 150Ω | 470K | 24Ω | 74Ω | 470K | †6800Ω | †205Ω |
| V4 | 35W4 | TP | TP | 74Ω | 125Ω | 125Ω | 110Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
†P TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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**WESTINGHOUSE MODELS H-677T4, H-678T4, H-679T4 (Ch.V-2239-6)**

# PARTS LIST AND DESCRIPTIONS

## TUBES ( GENERAL ELECTRIC, SYLVANIA )

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | Converter | 12AU6 | |
| V2 | Det. -AF Amp. | 12AV6 | |
| V3 | Output | 50C5 | |
| V4 | Rectifier | 35W4 | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Westinghouse PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | ■40 | 150 | 218V029H02 | PRS150V4020 | BBRD4215 | TCD485 | TDLD-5 | VLS-2438* | |
| B | ▲20 | 150 | | | | | | | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | Westinghouse PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C2 | 47 | | | 217V014A70 | SI 47 | D6-470 | LT6Q47 | UC-5447 | 5GA-Q47 | |
| C3 | 2.2 | | | 217V022A29 | NPO-SI 2.2 | TCZ-2R2 | CTA6V22C | CNO-522 | 5TCCB-V22 | |
| C4 | 390 | | 10% | 215V300H32 | DI-390 | D6-391 | L10T39 | | 5GA-T39S 10%* | |
| C5 | 20000 | 1400 | | 215V300H51 | | | | | | |
| C6 | 15 | | 10% | 215V011A50 | DI-15 | DD-150 | L10Q15 | UC-415 | 5GA-Q15S 10%* | |
| C7 | 20000 | 1400 | | 215V300H51 | | | | | | |
| C8 | .047 | 400 | | 210V111H09 | P488N-047 | DF-503 | CUB4S47 | GEM-4147 | 4TM-S47 | |
| C9 | 10000 | 1400 | | 215V306H03 | | | | | 20HKB-S1 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Westinghouse PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 2meg | ½ | 270V054H01 | B-76 | A47-2meg-Z | Q13-139 | U55 | Volume |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-2 | SWE-20 | 76-2 | US-27 | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | Westinghouse PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R2 | 2.2meg | | 250V222A25 | |
| R3 | 1meg | | 250V221A05 | |
| R4 | 22meg | | 250V222A26 | |
| R5 | 150Ω | | 250V221A51 | |

| ITEM No. | RATING | | Westinghouse PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R6 | 68Ω | | 250V226A80 | Note 1 |
| R7 | 6800Ω | | 250V226A82 | |
| R8 | 15Ω | 2 | 251V023H17 | |

Note 1. Some versions may use 47Ω in this application (Part #250V224A70).

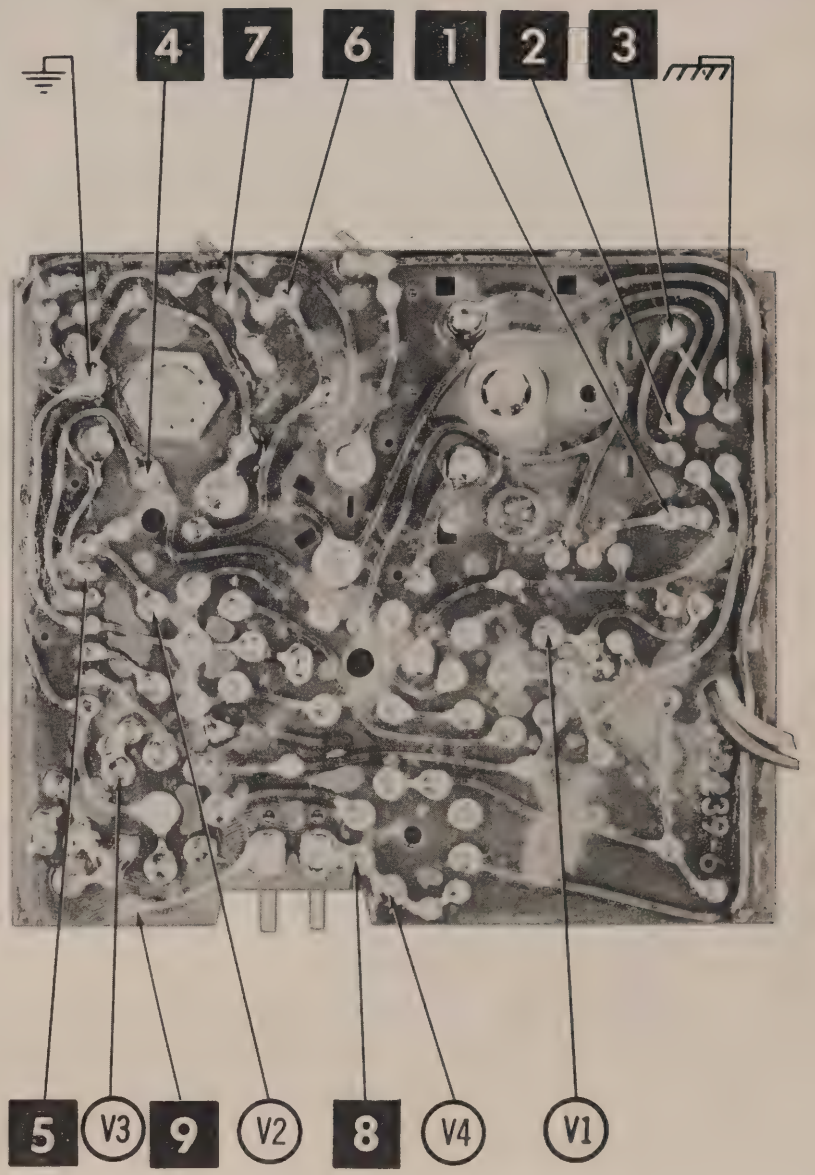
## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | Westinghouse PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Det. -Audio Circuit | 100mmf, 150mmf, 220mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg | 219V016H01 | Aerovox PA-512-3<br>Centralab PC-158<br>Sprague DT-5 |

# PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



# PARTS LIST AND DESCRIPTIONS (cont)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | Westinghouse PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loop Ant. | 310V043H01 | | | | | |
| L2 | Osc. Coil | 230V039H03 | | | | | |
| L3 | IF Trans. | 235V025H12 | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | Westinghouse PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2700Ω | 3-4Ω | Part of SP1 | 24S53 | A-3025 | AU-605 | A-3332 | 24S53 | S-12X | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | Westinghouse PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | 570V053H02① | 4A07 | ① Includes T1 |

## MISCELLANEOUS

| ITEM No. | PART NAME | Westinghouse PART No. | NOTES |
|---|---|---|---|
| M1 | Lamp | NE-2 | NE-2 |
| M2 | Tuning Cap. | 330V015H05 | 2 Gang, Ant. 7 - 365mmf, Osc. 7 - 95mmf |
| M3 | Clock Assembly | | Telechron #J2G2 |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 550V097H01 | Dial |
| Knob | 550V098H01 | Volume |
| Knob | 550V099H01 | Clock |
| Cabinet | 513V034H02 | Coral, Model H-678T4 |
| Cabinet | 513V034H01 | Champagne, Model H-677T4 |
| Cabinet | 513V034H03 | Aqua, Model H-679T4 |
| Back Cover | 310V043H01 | Includes L1 |
| Clock Crystal | 558V177H01 | |
| Hour Hand | 558V179H01 | |
| Minute Hand | 558V180H01 | |
| Second Hand | 558V181H01 | |
| Alarm Hand | 558V182H01 | |

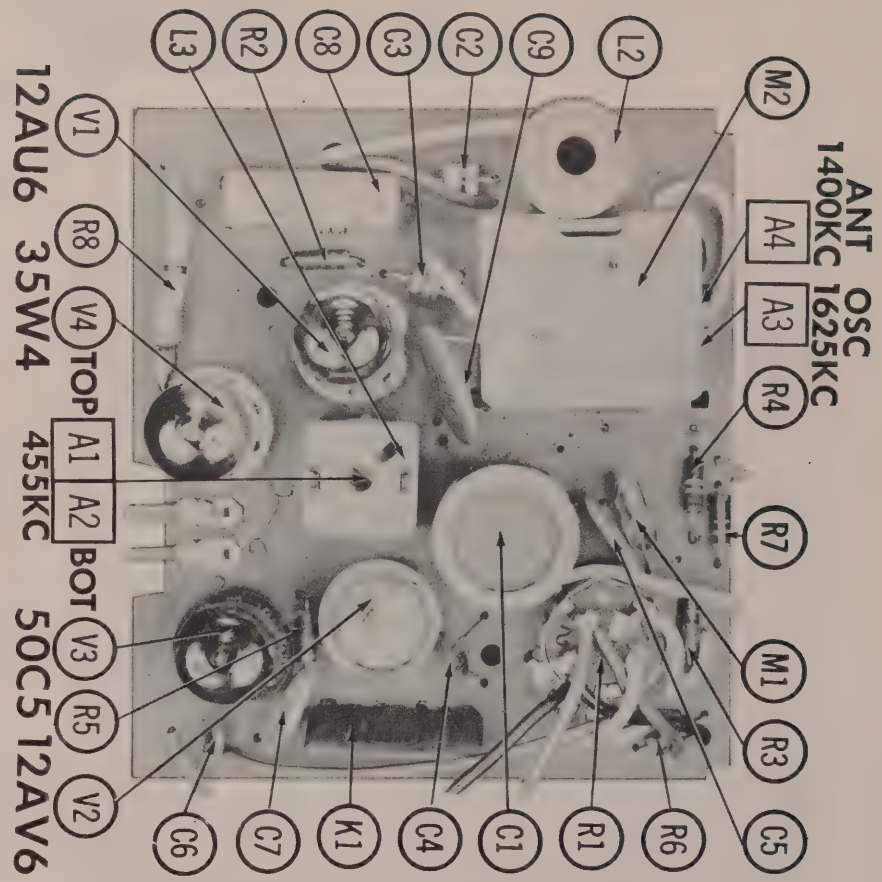
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

FOLDER 1 S

## CHASSIS—TOP VIEW




## DISASSEMBLY

PRINTED BOARD REMOVAL

1. Remove 2 control knobs.
2. Remove screw above tuning shaft.
3. Gently force top of cabinet rear to free top mounting tap of rear cover. Lift cover out of bottom grooves.
4. Slide printed board out of cabinet.

CLOCK REMOVAL

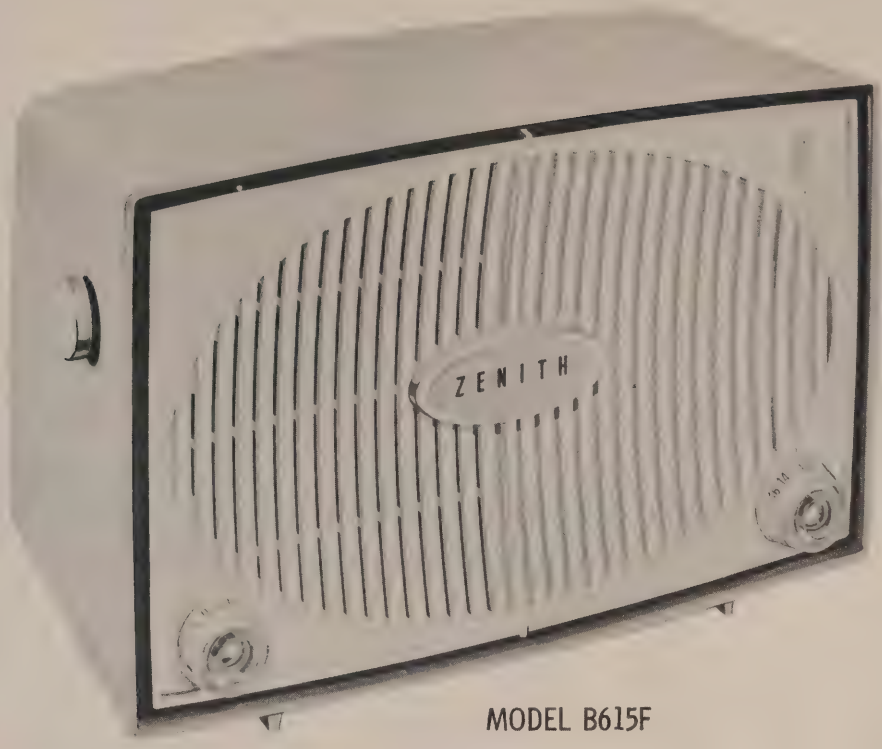
5. Remove clock control knob from front.
6. Gently force top of cabinet front up. Free and remove clock crystal.
7. Remove clock hands (Second, minute, hour, alarm set, in order)
8. Remove printed board chassis (see steps 1 thru 4)
9. Unsolder clock motor leads and clock switch lead.
10. Remove 4 clock mounting screws. Remove clock.

PHOTOFACT* Folder

EIA

# ZENITH MODELS
# B615F, G, L (Ch. 6B05)

ZENITH MODELS
B615F, G, L (Ch. 6B05)




MODEL B615F

ZENITH MODELS
B615F, G, L (Ch. 6B05)

| | |
|---|---|
| TRADE NAME | Zenith Models B615F, B615G, B615L (CH. 6B05) |
| MANUFACTURER | Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois |
| TYPE SET | AC-DC Operated 6 Tube AM Receiver |
| POWER SUPPLY | 110 - 120 Volts AC-DC |
| RATING | 28 Watts, .3 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 535 - 1620KC |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4, A6, A9..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A7, A8..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .5mfd. | High side to pin 7 (grid) of 12BE6 (V2). Low side to B-. | 455KC (400∿ Mod.) | Tuning gang fully open | Across voice coil | A1, A2, A3, A4 | Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation. |
| 2. | | Loop | 1600KC | 1600KC | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 600KC | 600KC | " | A6 | Adjust for maximum output. Repeat steps 2 & 3. |
| 4. | | " | 1400KC | Tune to 1400KC signal | " | A7, A8 | Adjust for maximum output. |
| 5. | | " | 600KC | Tune to 600KC signal | " | A9 | " |

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

# PARTS LIST AND DESCRIPTIONS

## TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | RF Amplifier | 12BA6 | |
| V2 | Converter | 12BE6 | |
| V3 | IF Amplifier | 12BA6 | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V4 | Det.-AVC-AF Amp. | 12AV6 | |
| V5 | Output | 35C5 | |
| V6 | Rectifier | 35W4 | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | ZENITH PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | ■80 | 150 | 22-2351 | AFH2-19 | XB0181 | FP216 | TMD-16 | TVL-2442.1 | |
| B | ▲40 | 150 | | | | | | | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | TOL | ZENITH PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C2 | 470 | | | 22-6 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C3 | .047 | 200 | | 22-2792 | P288N-047 | DF-503 | CUB2S47 | GEM-2147 | 2TM-S47 | |
| C4 | .047 | 100 | | 22-2792 | P288N-047 | DF-503 | CUB2S47 | GEM-2147 | 2TM-S47 | |
| C5 | 100 | | | 22-5 | BPD-0001 | DD-101 | L10T1 | CNO-310 | 5GA-T1 | |
| C6 | 100 | | | 22-5 | BPD-0001 | DD-101 | L10T1 | CNO-310 | 5GA-T1 | |
| C7 | 3300 | | 10% | 22-2670 | DI-3300 | | | JL-233 | 5HK-D33S 10%* | |
| C8 | 10000 | | | 22-3 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |
| C9 | 4700 | | | 22-4 | BPD-0047 | DD-472 | BYA10D47M | B-247 | 5HK-D47 | |
| C10 | 470 | | | 22-6 | BPD-00047 | DD-471 | BYA10T47 | B-347 | 5GA-T47 | |
| C11 | 4700 | | | 22-4 | BPD-0047 | DD-472 | BYA10D47M | B-247 | 5HK-D47 | |
| C12 | .01 | 400 | | 22-2811 | P488N-01 | DD-103 | CUB4S1 | GEM-411 | 4TM-S1 | |
| C13 | .047 | 200 | | 22-2792 | P288N-047 | DF-503 | CUB2S47 | GEM-2147 | 2TM-S47 | |
| C14 | 10000 | | | 22-3 | BPD-01 | DD-103 | BYA10S1 | B-110 | 5HK-S1 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ZENITH PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | IRC PART No. | MALLORY PART No. | |
| R1A | 1meg | ½ | 63-4408 | BT-82 | A47F5-1meg | Q19-137X | UT-443 | Volume, Tap @ 500K |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | |
| R2A | 1meg | ½ | 63-3640 | B-70 | A47-1meg-Z | Q13-137 | U53 | Tone |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |

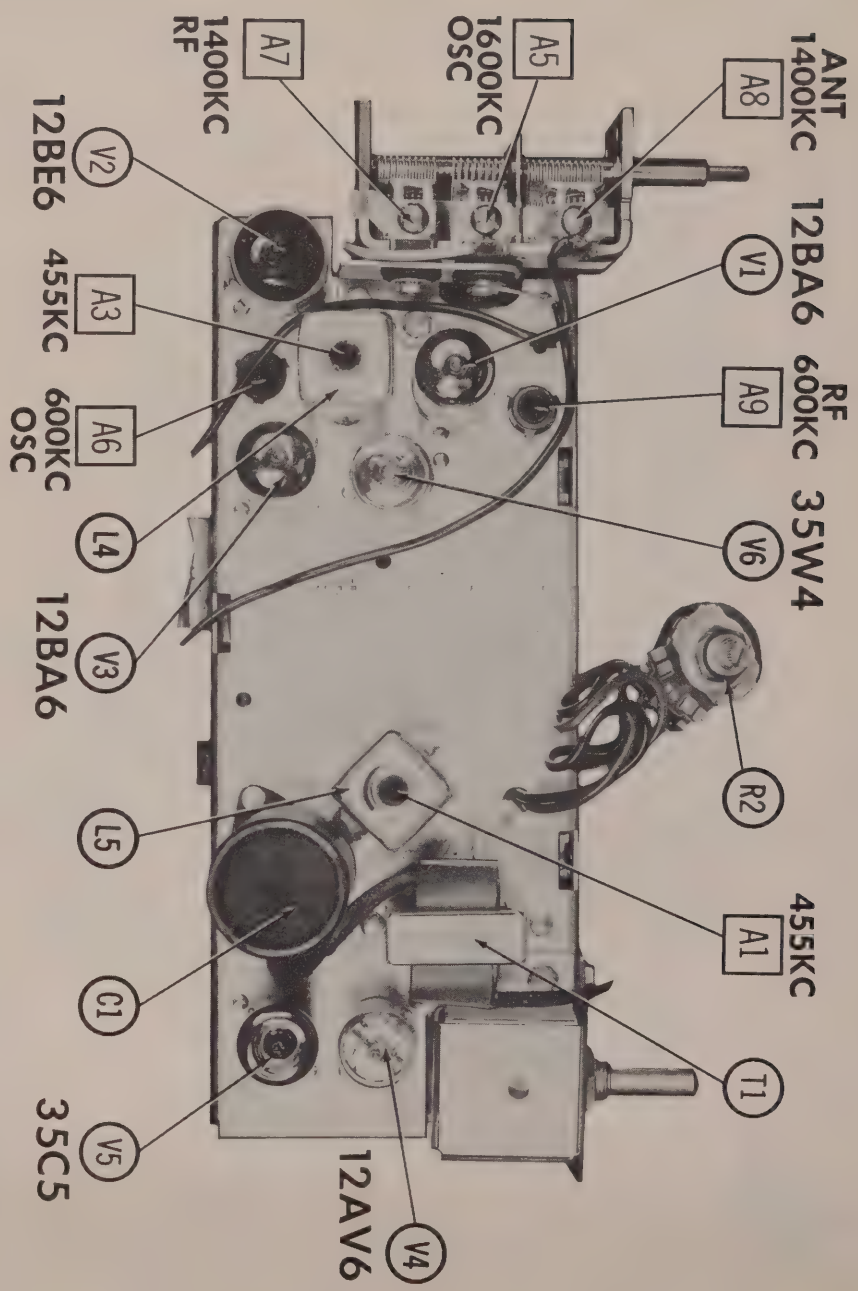
## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | | ZENITH PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R3 | 1meg | | 63-1912 | |
| R4 | 10K | | 63-1828 | |
| R5 | 330Ω | | | |
| R6 | 22K | | 63-1842 | |
| R7 | 1meg | | 63-1912 | |
| R8 | 47K | | 63-1856 | |
| R9 | 2.2meg | | 63-1926 | |

| ITEM No. | RATING | | ZENITH PART No. | NOTES |
|---|---|---|---|---|
| | OHMS | WATT | | |
| R10 | 470K | | 63-1898 | |
| R11 | 100K | | 63-1869 | |
| R12 | 4.7meg | | 63-1940 | |
| R13 | 470K | | 63-1898 | |
| R14 | 470K | | 63-1898 | |
| R15 | 150Ω | | 63-1750 | |
| R16 | 1000Ω | 1 | 63-1574 | |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (cont)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|
| | | ZENITH PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
| L1 | Loopstick | S-44810 | | | | | |
| L2 | RF Trans. | S-44923 | | | | | |
| L3 | Osc. Coil | S-43910 | | | | | |
| L4 | Input IF | 95-1504 | 16-6780 | BC-356 | 13-PC1 | RF-4 | |
| L5 | Output IF | 95-1505 | 16-6781 | | 13-PC6 | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ZENITH PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2900Ω | 3-4Ω | 95-1643 | 26S58 | A-3025① | AU-605① | A-3332① | 26S58 | S-12X① | ① Use original frame and rotate 90 degrees |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | ZENITH PART No. | QUAM PART No. | |
| SP1 | 6" x 9" | PM | 3.2Ω | 49-869 | 69A3 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | ZENITH PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap. | 22-3101 | 3 Gang; Ant. 21-351mmf, RF 7-246mmf, Osc. 6-80mmf |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

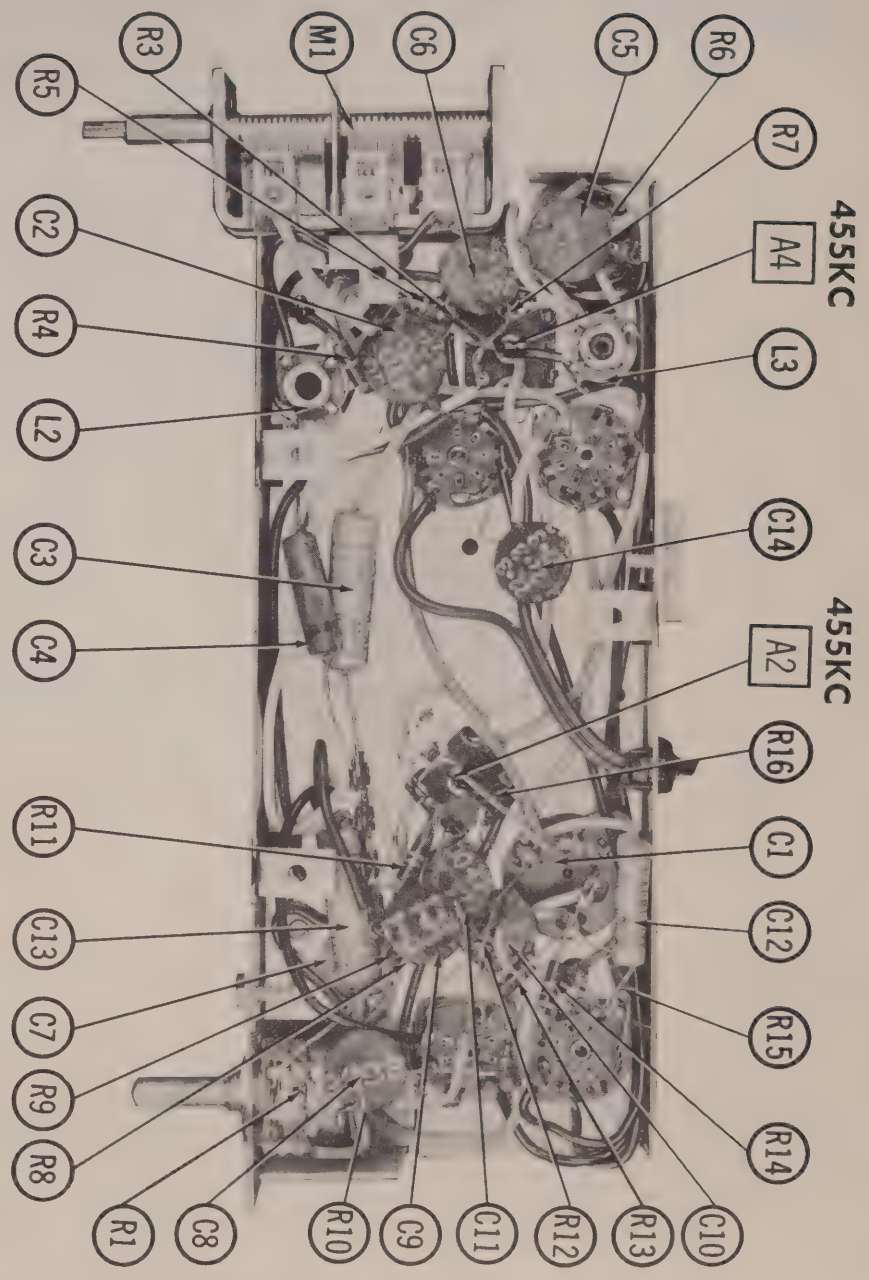
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 46-2039 | Tuning |
| Knob Ass'y. | S-44973 | Volume, Model B615F |
| Knob Ass'y. | S-44969 | Volume, Model B615G |
| Knob Ass'y. | S-44971 | Volume, Model B615L |
| Knob | 46-2067 | Tone, Model B615F |
| Knob | 46-2068 | Tone, Model B615G |
| Knob | 46-2066 | Tone, Model B615L |
| Knob | 46-2041 | Dial, Model B615F |
| Knob | 46-2042 | Dial, Model B615G |
| Knob | 46-2040 | Dial, Model B615L |
| Cabinet | 14-2508 | Model B615F |
| Cabinet | 14-2509 | Model B615G |
| Cabinet | 14-2507 | Model B615L |

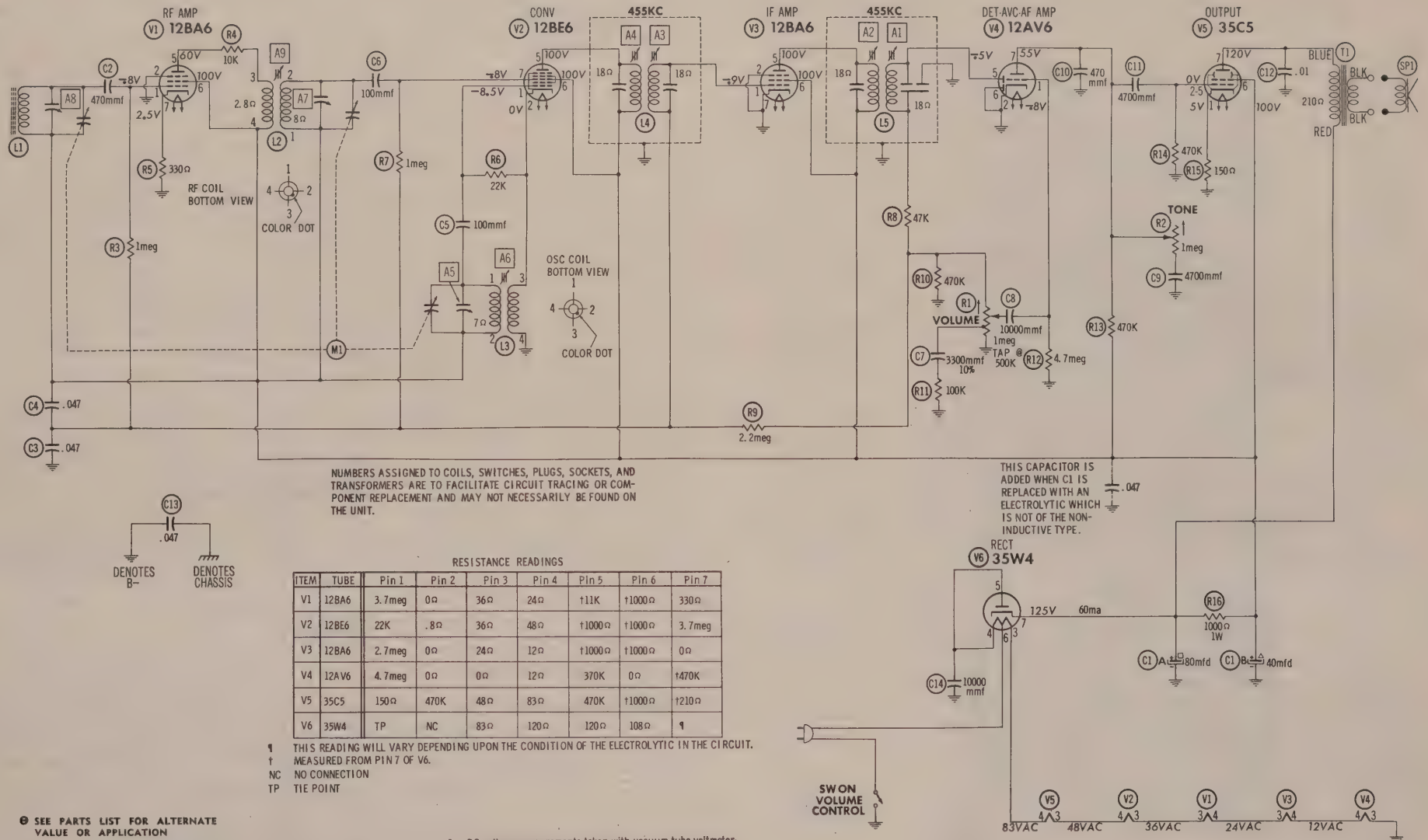
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

## CHASSIS—BOTTOM VIEW






NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12BA6 | 3.7meg | 0Ω | 36Ω | 24Ω | †11K | †1000Ω | 330Ω |
| V2 | 12BE6 | 22K | .8Ω | 36Ω | 48Ω | †1000Ω | †1000Ω | 3.7meg |
| V3 | 12BA6 | 2.7meg | 0Ω | 24Ω | 12Ω | †1000Ω | †1000Ω | 0Ω |
| V4 | 12AV6 | 4.7meg | 0Ω | 0Ω | 12Ω | 370K | 0Ω | †470K |
| V5 | 35C5 | 150Ω | 470K | 48Ω | 83Ω | 470K | †1000Ω | †210Ω |
| V6 | 35W4 | TP | NC | 83Ω | 120Ω | 120Ω | 108Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION
TP TIE POINT

**SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION**

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

**ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)**

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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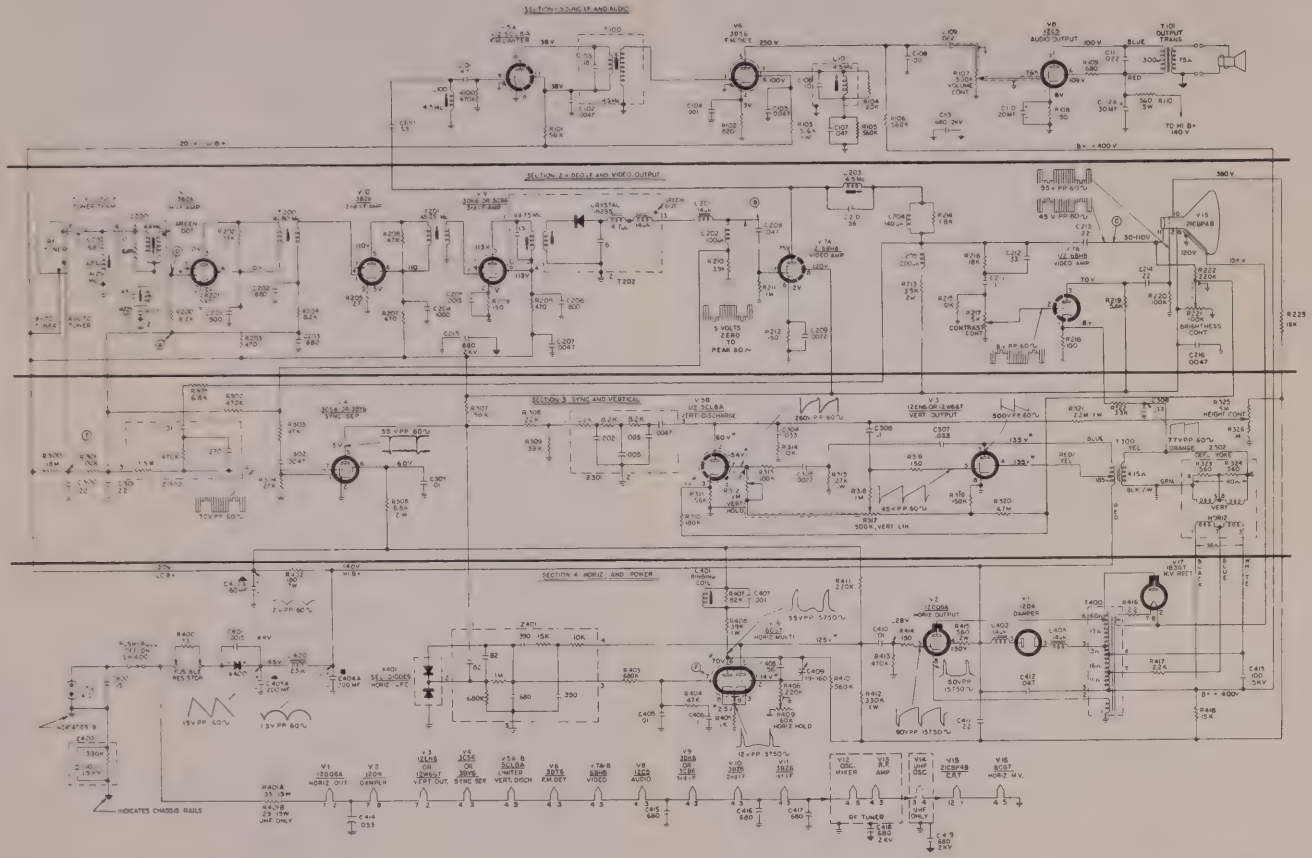
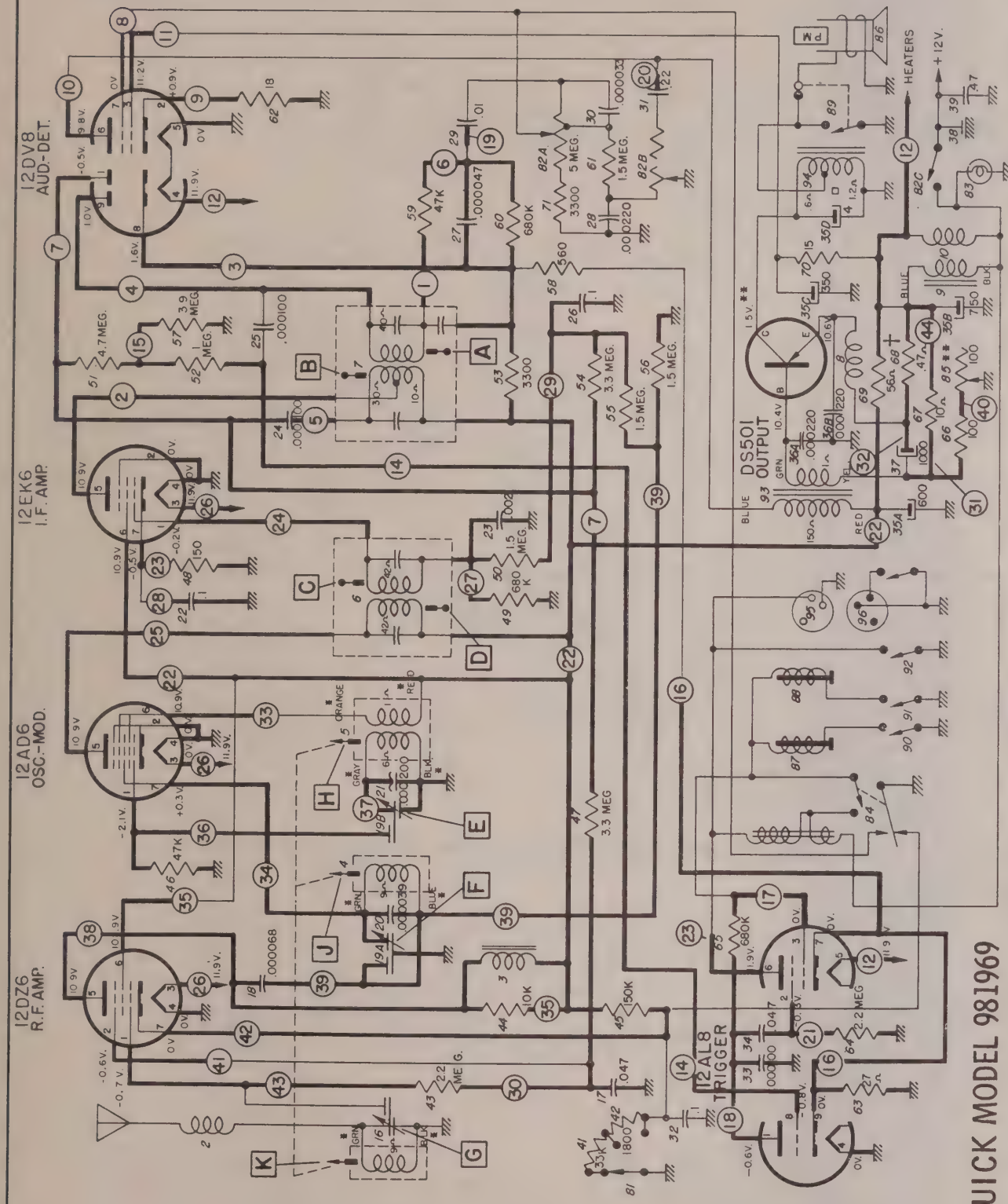
**ZENITH MODELS**
**B615F, G, L (Ch. 6B05)**

WESTINGHOUSE MODELS H-21K270, 271, H-21KU270, 271, H-21T262 thru H-21T271, H-21TU262 thru H-21TU269 ( CH. V-2374-1, -2 )



Schematic Diagram Courtesy of Westinghouse Electric Corp., Television-Radio Div.

TUNER MAY STOP SEEKING WHEN SOLENOID ENERGIZES DUE TO THE DROP IN BATTERY ELIMINATOR VOLTAGE.

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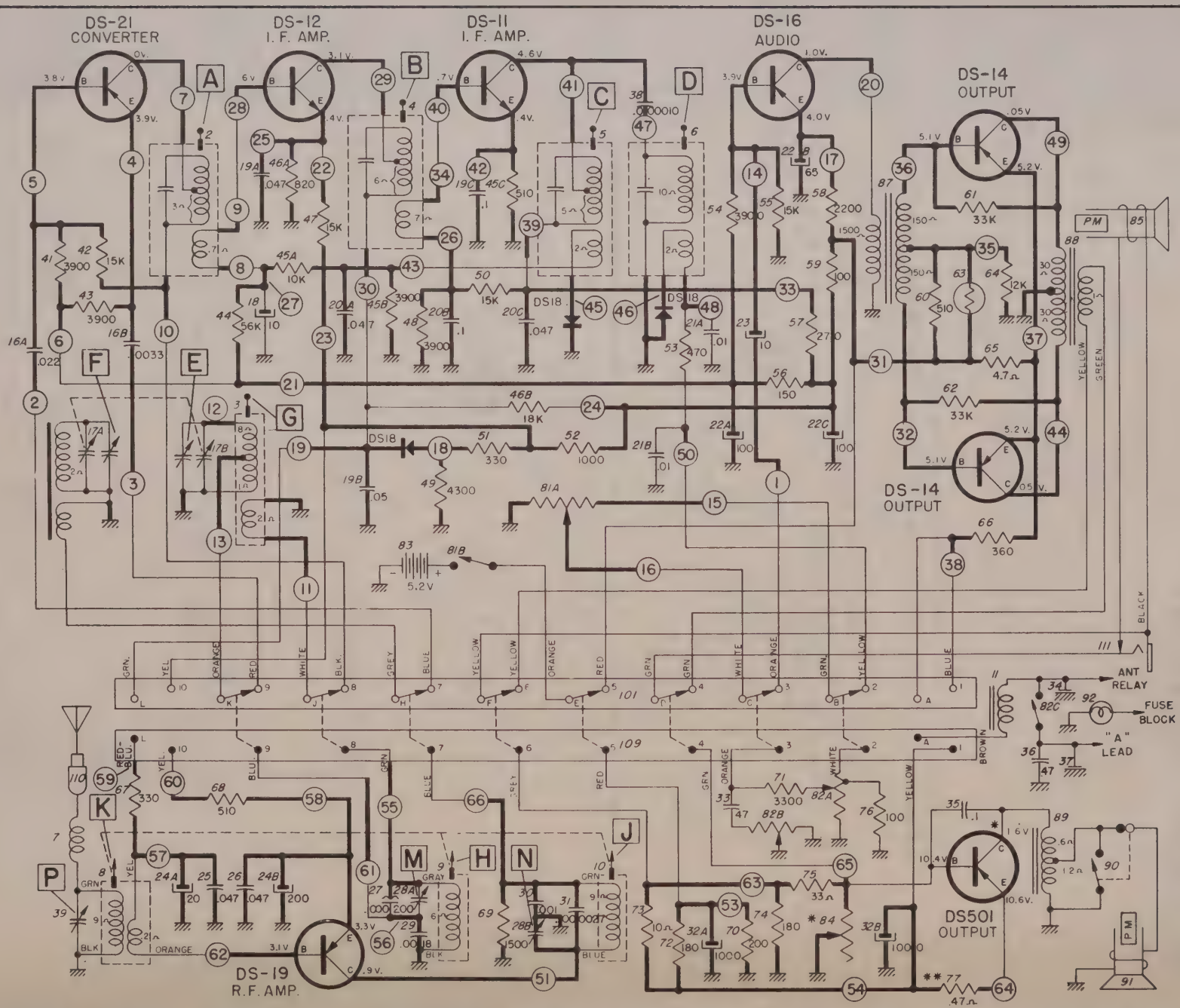


PONTIAC MODEL 988978 Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.

# The PHOTOFACT Servicer

SET 445 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JUNE 1959

## CONTENTS PHOTOFACT SET 445


| TRADE NAME AND MODEL | SET AND FOLDER NO. |
|---|---|
| **TELEVISION RECEIVERS** | |
| **MOTOROLA** | |
| Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T3B, M, 17T32BZ (Ch. LTS-430, TS-430, TS-430Y) | 445-1 |
| **SETCHELL-CARLSON** | |
| 21C159, 21L159, 24C159, 24L159, 27C159, 27L159 (Ch. Z159, 159) | 445-2 |
| **OTHER EQUIPMENT** | |
| **CROWN Tape Recorder** | |
| Prince | 445-3 |
| **LAFAYETTE** | |
| KT-500, LT-50 | 445-4 |
| PA-61 | 445-5 |
| **MASCO** | |
| A-10, AS-10 | 445-6 |
| A-18, AS-18 | 445-7 |
| **MOTOROLA** | |
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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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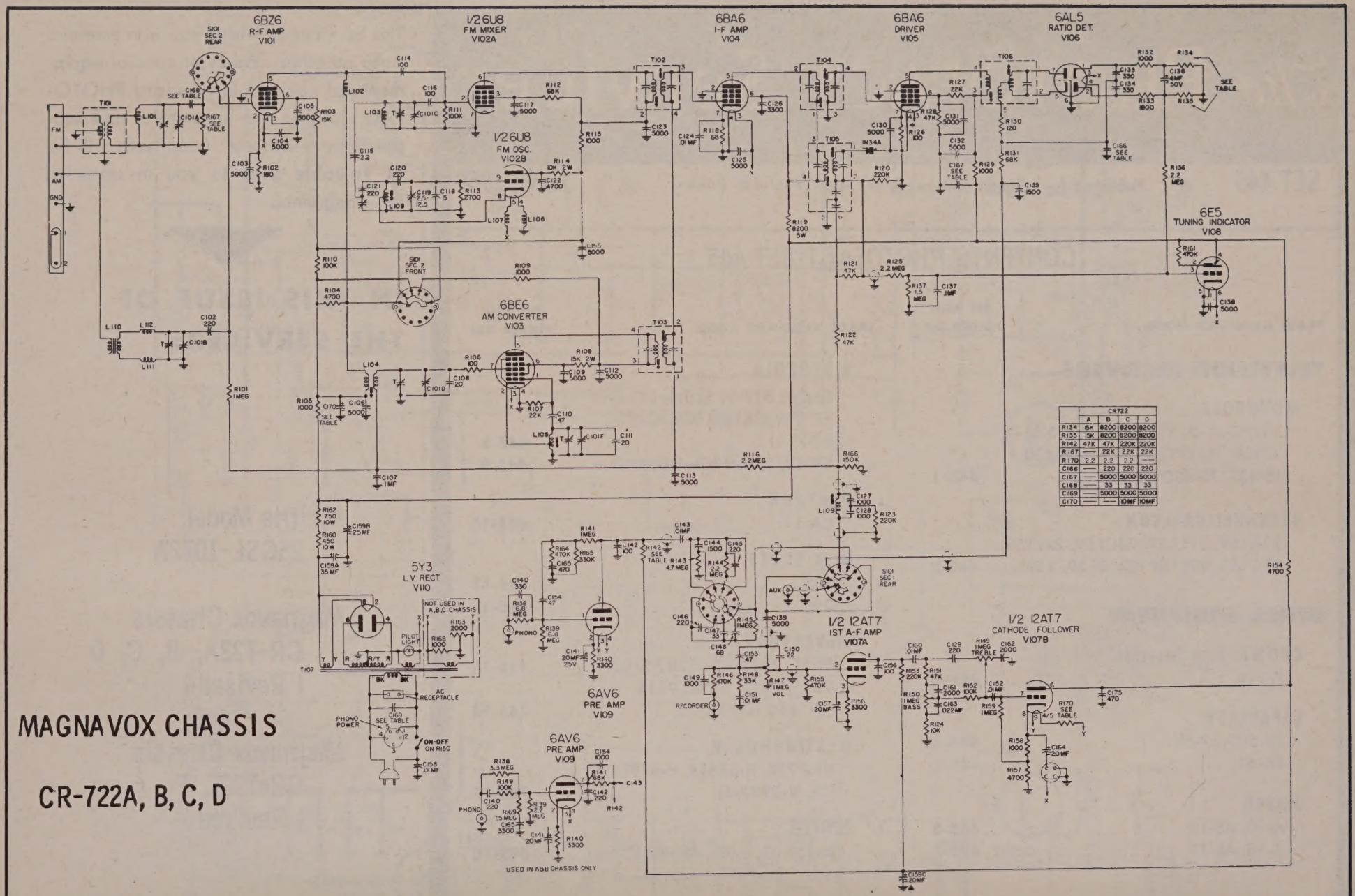
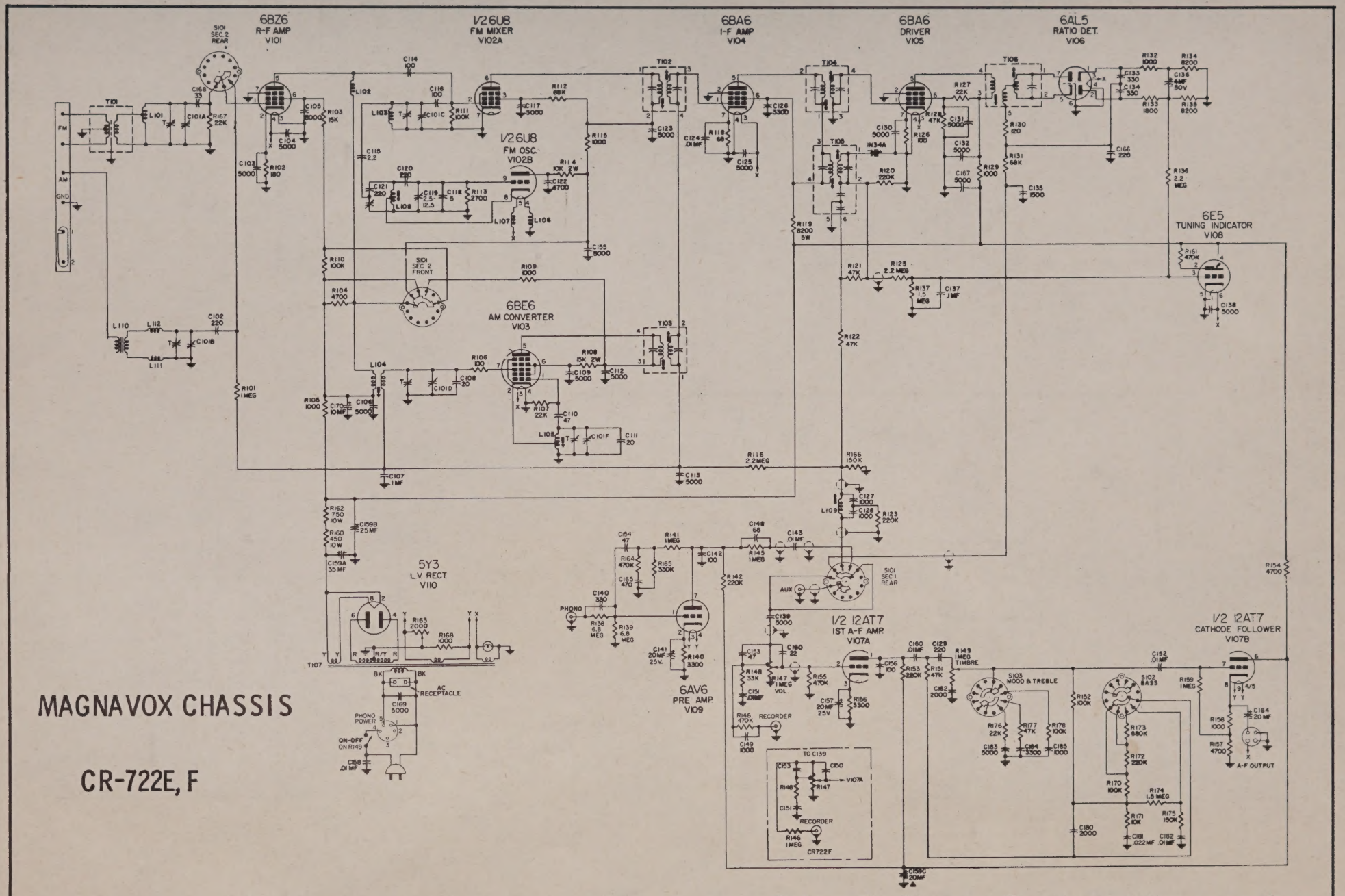
Airline Model
25GSL-1072A

Magnavox Chassis
CR-722A, B, C, D
( Revised )

Magnavox Chassis
CR-722E, F
( Revised )



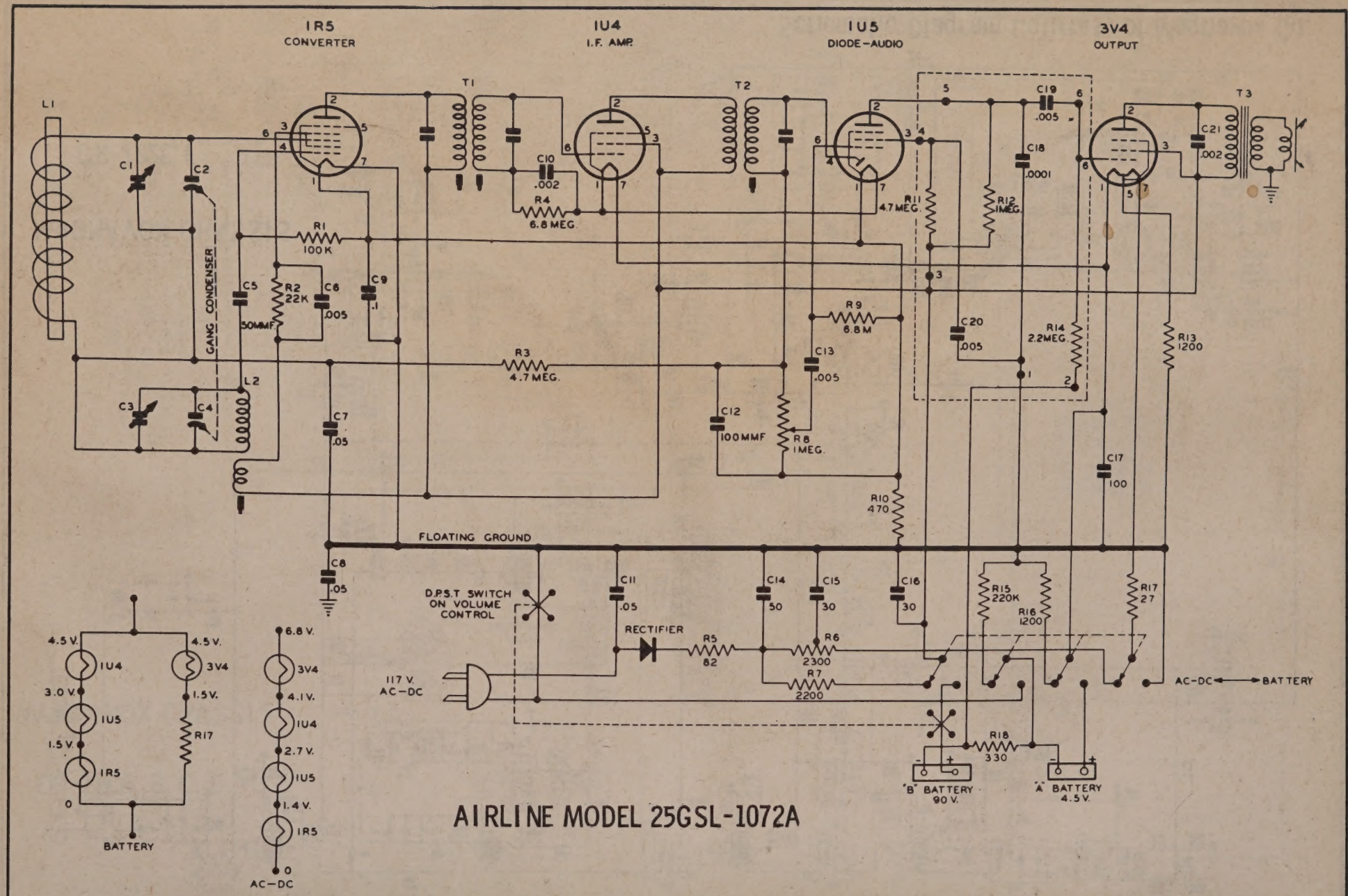

| | CR722 | | | |
|---|---|---|---|---|
| | A | B | C | D |
| R134 | 15K | 8200 | 8200 | 8200 |
| R135 | 15K | 8200 | 8200 | 8200 |
| R142 | 47K | 47K | 220K | 220K |
| R167 | — | 22K | 22K | 22K |
| R170 | 2.2 | 2.2 | 2.2 | — |
| C166 | — | 220 | 220 | 220 |
| C167 | — | 5000 | 5000 | 5000 |
| C168 | — | 33 | 33 | 33 |
| C169 | — | 5000 | 5000 | 5000 |
| C170 | — | — | 10MF | 10MF |




# MAGNAVOX CHASSIS

## CR-722E, F

Schematic Diagram Courtesy of Magnavox Co.




AIRLINE MODEL 25GSL-1072A

Schematic Diagram Courtesy of Montgomery Ward & Co.